

BASIC GUIDE TO DENTAL INSTRUMENTS

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Blackwell Munksgaard, a Blackwell Publishing Company

Editorial Offices:

Blackwell Publishing Ltd, 9600 Garsington Road, Oxford OX4 2DQ, UK

Tel: +44 (0)1865 776868

Blackwell Publishing Professional, 2121 State Avenue, Ames, Iowa 50014-8300, USA

Tel: +1 515 292 0140

Blackwell Publishing Asia, 550 Swanston Street, Carlton, Victoria 3053, Australia

Tel: +61 (0)3 8359 1011

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The author has no financial interests and no formal links with any of the companies whose products are referred to in this book.

First published 2006 by Blackwell Munksgaard

ISBN-10: 1-4051-3379-1

ISBN-13: 978-1-4051-3379-1

Library of Congress Cataloging-in-Publication Data

Scheller, Carmen.

Basic guide to dental instruments / Carmen Scheller.

p. ; cm.

Includes index.

ISBN-13: 978-1-4051-3379-1 (pbk. : alk. paper)

ISBN-10: 1-4051-3379-1 (pbk. : alk. paper)

1. Dental instruments and apparatus – Handbooks, manuals, etc. I. Title.

[DNLM: 1. Dental Instruments – Handbooks. WU 49 S322b 2006]

RK681.S33 2006

617.6'0028 – dc22

2005029604

A catalogue record for this title is available from the British Library

Set in 9 on 11.5pt Sabon

by SNP Best-set Typesetter Ltd., Hong Kong

Printed and bound in Singapore

by COS Printers Pte Ltd

The publisher's policy is to use permanent paper from mills that operate a sustainable forestry policy, and which has been manufactured from pulp processed using acid-free and elementary chlorine-free practices. Furthermore, the publisher ensures that the text paper and cover board used have met acceptable environmental accreditation standards.

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www.blackwellmunksgaard.com

CONTENTS

<i>Dedication</i>	iv
<i>Acknowledgements</i>	v
<i>How to Use This Book</i>	vi
Section 1: Infection Control in the Dental Surgery	1
Section 2: Dental Radiography	15
Section 3: Basic Instruments	31
Section 4: Instruments and Sundries Used in Moisture Control	39
Section 5: Local Anaesthesia	47
Section 6: Instruments Used for Rubber Dam Placement	57
Section 7: Handpieces, Burs and Rotary Attachments	65
Section 8: Instruments Used in Basic Restorative Procedures	83
Section 9: Matrix Bands and Matrix Retainers	111
Section 10: Instruments Used in Endodontic Treatment	125
Section 11: Elevators	143
Section 12: Extraction Forceps	149
Section 13: Surgical Instruments	161
Section 14: Measuring Devices	189
Section 15: Impression Trays	195
Section 16: Orthodontic Instruments	201
Section 17: Instruments Used in Periodontal Procedures	235
Section 18: Instruments Used in Removable and Fixed Prosthodontics	251
<i>Appendix</i>	269
<i>Index</i>	271

To my family, Mom, Dad and Clayton, for giving me the strength to follow my dreams, and to Padraig for being a big part of that dream.

ACKNOWLEDGEMENTS

I would like to thank the many people who helped with the development of this instrument guide: Margaret Crosswaite, Tina Gorman, Helen Phipps, Joan Brennan, Joy Markey and Ann Bradley for the constant guidance, encouragement and advice; Dr. Michael O'Sullivan, Dr. Frank Quinn, Dr. Therese Garvey, Dr. Johanna Glennon and Dr. Maria Jennings for their advice, encouragement and editing of relevant chapters; Catherine Waldron and Anne O'Byrne for their assistance; Dr. Barry Harrington, who helped me at the early stages of this project; Professor David Coleman, who supplied the photography equipment needed to take some of the photos; the staff at the Central Sterile Services Department (Dublin Dental School and Hospital) who were always helpful in finding the 'best' instruments for photography purposes; and Dr. Frank Quinn who supplied some excellent clinical photographs.

Thank you to the following companies and people who supplied photographs:

American Eagle Instruments Inc.
DENTSPLY Ash® Instruments
Dynaflex
Garrison Dental Solutions
Henry Schein Ireland
Hu-Friedy
J. Morita Europe GMBH
Kerr
Kodak
Laerdal Medical Ltd
Learning and Teaching Scotland
LM – Instruments Oy
L&R Manufacturing
Dr. Anthony Maganzini
Miltex
Ormco Europe
Owandy Dental Imaging
Premier Dental Products Company
Dr. Frank Quinn
Roydent Dental Products
SDI
Septodont
Sirona Dental Systems
Sybron Endo
Total Care
Ultrasonics
W&H (UK) LTD
Young Dental

HOW TO USE THIS BOOK

As the dental profession evolves, there is an increasing demand for supplementary material that can keep up with advancing trends. ‘Hands on’ practical experience is essential for anyone in the dental profession, and this needs to be supplemented with written information to reinforce our practical experiences.

This illustrated manual has been prepared for students working and studying in the dental profession. It may be used as a study aid or kept in the dental surgery as a reference guide. This manual is intended to complement other methods of learning, i.e. textbooks, lecture notes etc., and is not meant to be a comprehensive resource. The 100 items used in the National Examining Board for Dental Nurses in the United Kingdom are included in this book, and the current (at time of publishing) ‘spotter’ items list is included in the Appendix.

Because many dental instruments look similar, and can be confusing to a student, the ‘false friends’ sub-sections identify instruments that may resemble the particular instrument. This manual is not intended to be a complete representation of all dental instruments, but it does include examples from each dental discipline. As many dental instruments are multi-functional and are referred to by more than one name, where possible, these are given beside the name of the instrument. Complete set-ups have been included at the end of most sections for various procedures. The dental professional may have to modify these lists, depending on operator preference.

Each section is dedicated to a specific discipline or division of dentistry. Some instruments feature in many sections, and these have been included in the set-up sub-sections of the relevant sections. Infection control is a fundamental requirement in the dental surgery, and as such the first section is dedicated to this area. This section aims to introduce the principles of health and safety, which must always be at the forefront of a dental professional’s mind. Contact the legislative bodies for appropriate regulations and legislation relevant to your workplace.

The instruments in this guide are not to scale, and during photography some colours may have been altered.

SECTION 1

INFECTION CONTROL IN THE DENTAL SURGERY

It is the responsibility of the dental team to ensure that the appropriate and correct procedures are carried out in relation to infection control to protect the patients, the public and themselves.





(a)



(c)



(b)

Figure 1.1

PROTECTIVE WEAR**FIGURE 1.1 a, b, c****Name**

(a) Mask (b) Safety glasses (c) Face shields

Function, precautions and directions for use

- To protect the dental team from micro-organisms, debris, splatter and chemicals
- A mask is worn to protect the mucous membranes of the nose and mouth. It filters out small particles
 - Should always be changed between each patient or before if it is visibly soiled
 - Should be worn during patient care, sterilisation, disinfection, cleaning procedures and during laboratory work
- Safety glasses and/or face shields are worn to protect the mucous membranes of the eyes
 - Should be disinfected between patients
 - A face shield can be used instead of safety glasses, but a mask must still be worn
 - Should be large enough to cover the eye area completely and provide protection from the top and side. With some safety glasses additional top and side shields have to be added to be used for this purpose
 - Safety glasses are available to fit over prescription eye wear
 - Must be shatterproof

Varieties

Different types of masks and glasses available

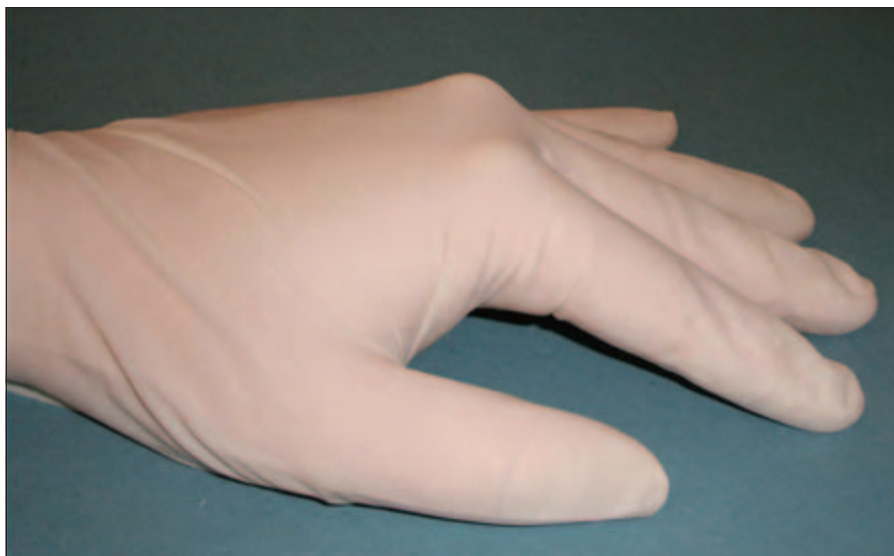
**Figure 1.2****(a)****(b)****Figure 1.3**

FIGURE 1.2**Name**

Protective gloves

Function and directions for use

- To protect the dental team from direct contact with micro-organisms, debris, splatter and chemicals
- Worn during patient care when coming in contact with contaminated objects and chemicals, and when working intra-orally
- Always change between patients
- Do not wash gloves
- Replace damaged and ripped gloves immediately
- Always wash and dry hands thoroughly prior to donning gloves
- It is important to make sure gloves fit properly

Varieties

- Made from many different materials, i.e. latex, vinyl, nitrile.
- Available packaged as sterile surgical gloves
- Rubber utility gloves/heavy duty gloves are used during sterilisation procedures

WORK SURFACES**FIGURE 1.3 a, b****Name**

Non-permeable barriers

Function and features

- Used to cover surfaces to prevent contamination
- Must be impermeable
- Single use; to be disposed of in the contaminated waste

Varieties

Many different types and sizes available



Figure 1.4



(a)



(b)

Figure 1.5

ITEMS USED FOR IDENTIFICATION AND ORGANISATION DURING STERILISATION**FIGURE 1.4****Name**

Coloured identification rings

Function and feature

- Used to organise and identify instruments
- Autoclavable

Varieties

- Many different types and sizes available
- Coloured autoclavable tape can also be used

FIGURE 1.5 a, b, c**Name**

Instrument cassettes

Function(s)

- Used to organise and identify instruments during sterilisation and disinfection
- Can double as an instrument tray during procedures

Varieties

Many different types and sizes available; including plastic and metal types



(c)

Figure 1.5 (Continued)



Figure 1.6



(a)



(b)

Figure 1.7



Figure 1.8

FIGURE 1.6**Name**

Autoclave tape

Function and features

- Used to secure instrument wrap or pouches prior to sterilisation
- Will change colour once exposed to a certain temperature, but this does not indicate whether sterilisation has occurred
- Can be written on to indicate the contents of the package

Varieties

Many different types and sizes available

FIGURE 1.7 a, b**Name**

Sterilisation pouch

Functions and features

- Used to wrap instruments prior to sterilisation
- Aids in organisation of instruments
- One side may be transparent to allow for viewing of the pouch contents (Figure 1.7 a, b)
- Coloured markings indicate that a certain temperature has been reached during the sterilisation cycle
- Instruments will remain sterile in pouch until it is punctured or opened

Varieties

Many different types and sizes available

STERILISATION EQUIPMENT**FIGURE 1.8****Name**

Autoclave

Function and directions for use

- Uses steam under high pressure to achieve sterilisation
- Follow manufacturer's directions for use
- Consult local legislation and guidelines in regards to appropriate sterilisation procedures

Varieties

Many different types and sizes available

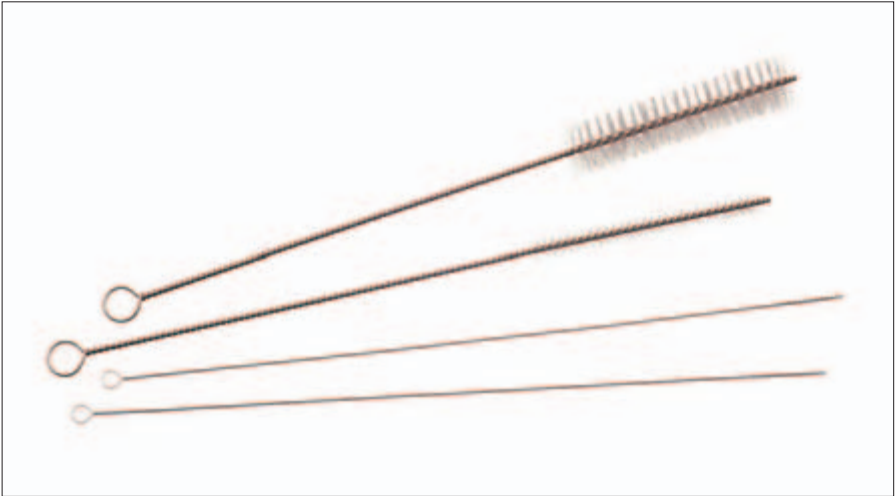
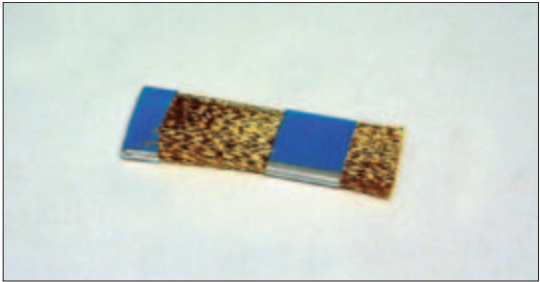
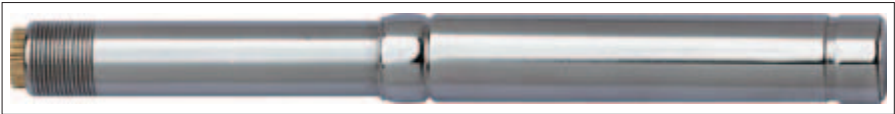


Figure 1.9



(a)



(b)

Figure 1.10

MANUAL CLEANING AIDS**FIGURE 1.9****Name**

Bottle brushes

Functions, features and precautions

- Manual cleaning is never recommended except when ultrasonic cleaning is not effective in removing debris
- Used along with a soapy cleaner to remove debris prior to sterilisation
- Allows cleaning inside suction tubes
- Long handle allows a greater distance between the operator and the contaminated object
- Should always be used submersed in water to reduce splatter
- Always wear heavy duty utility gloves while using bottle brushes

Varieties

Many different types and sizes available

FIGURE 1.10 a, b**Name**

Bur brushes

Function and precautions

- Manual cleaning is only recommended when ultrasonic cleaning is not effective in removing debris
- Used along with cleaner to remove debris prior to sterilisation
- Allows for the cleaning of burs with small, hard-to-clean flutes
- Always wear rubber utility gloves/heavy duty gloves while using bur brushes

Varieties

Many different types and sizes available



Figure 1.11



Figure 1.12

FIGURE 1.11**Name**

Ultrasonic cleaner

Function(s) and directions for use

- Used along with a soapy cleaner
- Uses sound waves to reduce bioburden and debris from instruments prior to sterilisation
- Follow manufacturer's instructions for solution types and length of time needed for cleaning

Varieties

Many different types and sizes available

FIGURE 1.12**Name**

Assistina

Function(s) and directions for use

- Uses air to run cleaning fluid solution and oil through handpieces
- Used to expel debris from handpieces
- Plastic cover over handpiece attachment is used to reduce aerosol
- Follow manufacturer's instructions for use

Varieties

Many different types available

SECTION 2

DENTAL RADIOGRAPHY

Radiographs are important tools in the diagnosing of dental disease. There are many types of radiographs available, all of which are used for different purposes. There are two main types of dental radiographic films: intra-oral and extra-oral.





Figure 2.1

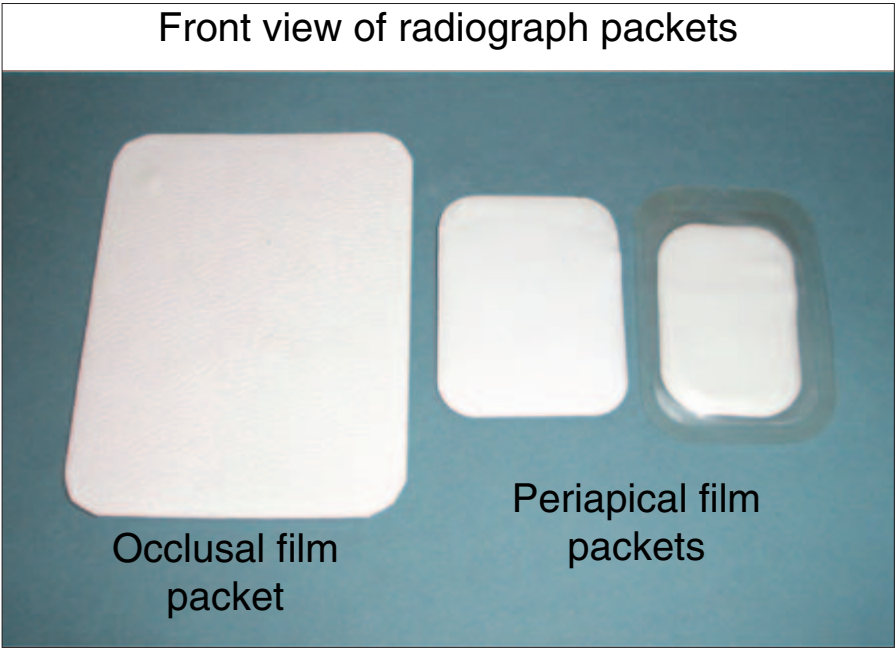


Figure 2.2

INTRA-ORAL RADIOGRAPHS

FIGURES 2.1; 2.2

- A detailed radiograph film, which is exposed while in the patient's mouth
- Used in conjunction with a film holder for accurate placement
- Some films may be covered in a clear plastic sleeve for infection control purposes (see Figure 2.2)
- Every film has a bump to assist in film orientation
- The bump always faces towards the X-ray tube
- Inside the film packet:
 - Black paper on either side of film to protect film from light (see Figure 2.1)
 - On the back of the film there is a thin sheet of lead foil to absorb stray scatter radiation

FIGURE 2.3

Name

Occlusal radiograph

Type

Intra-oral radiograph

Functions

- Provides an image of the maxillary or mandibular arch
- Used to check eruption of teeth, to locate foreign objects, jaw fractures and supernumerary teeth, and to detect hard and soft tissue abnormalities



Figure 2.3

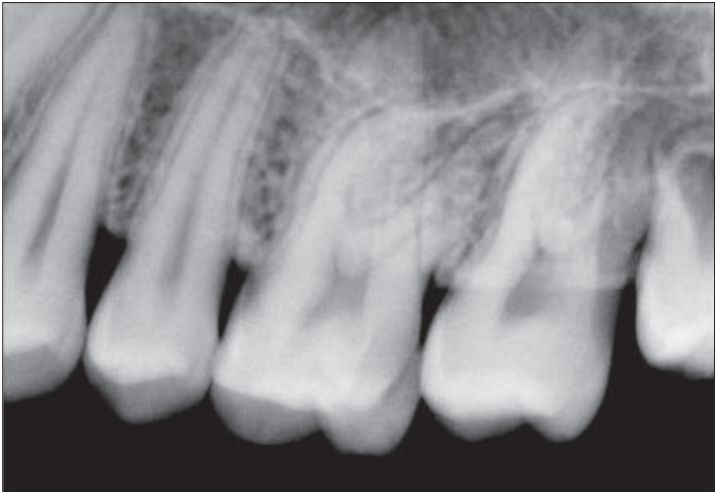


Figure 2.4

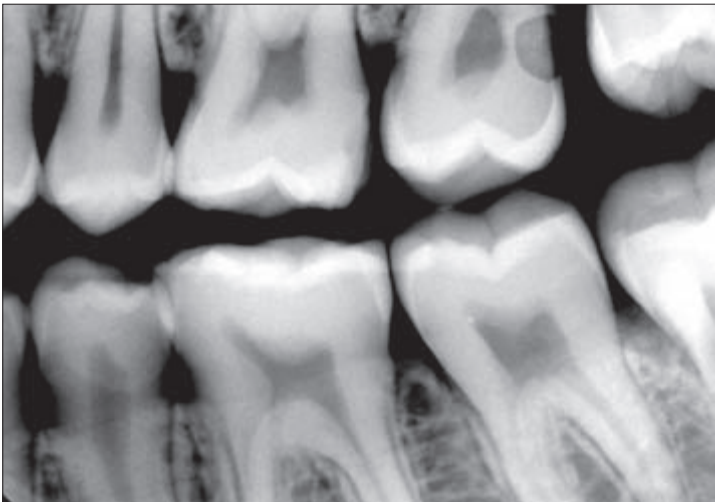


Figure 2.5

FIGURE 2.4**Name**

Peri-apical radiograph

Type

Intra-oral radiograph

Functions

- Provides an image of the entire tooth (crown to root and supporting structures)
- A detailed image of two to four teeth may be obtained on one radiograph
- Used to show apical infections, retained roots, morphology of roots, length of root canal, post-trauma, apical cysts, and evaluation of implants, lesions and periodontal status

Varieties

- Different sizes of films are available depending on the patient's mouth size and tolerance level
- The same size of radiographic film can be used for bite-wing radiographs

FIGURE 2.5**Name**

Bite-wing radiograph

Type

Intra-oral radiograph

Functions

- Provides an image of the crowns of the premolars and molars on either the right or the left side
- Used to detect interproximal caries, recurrent caries and to check bone levels

Varieties

- The same size of radiographic film can be used for peri-apical radiographs
- Can have vertical and horizontal bite-wing radiographs



Cassette for an extra-oral film

Figure 2.6

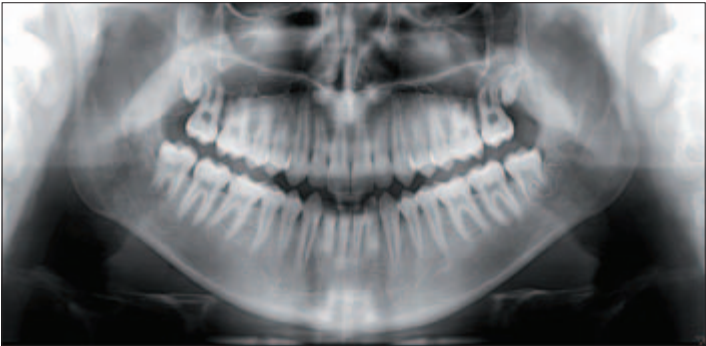


Figure 2.7



Figure 2.8

EXTRA-ORAL RADIOGRAPHS

FIGURE 2.6

- Are exposed outside the patient's mouth
- Panoramic radiograph film is placed within the cassette, then on the panoramic X-ray machine
- Will show a full view of the maxillary and mandibular dental arches, but with less detail than an intra-oral radiograph
- The film is protected from light in the cassette, which is held between two intensifying screens (see Figure 2.6)
- This type of film needs a special machine for exposure

FIGURE 2.7

Name

Panoramic radiograph/OPG (Orthopantomograph)

Type

Extra-oral radiograph

Functions

- Provides an image of all the teeth in both the maxillary and mandibular arches and supporting structures
- Used to view the periodontium, bone levels, pathology, temporomandibular joints, sinuses, impacted teeth, position of dental nerves, eruption patterns, orientation of third molars, retained roots, fractures, cysts and restorations

FIGURE 2.8

Name

Cephalometric radiograph

Type

Extra-oral radiograph

Functions

- Provides an image of the skull – mostly used in orthodontic assessments and oral surgery
- Allows the operator to take measurements of the skull
- Used to monitor treatment progression and to detect fractures

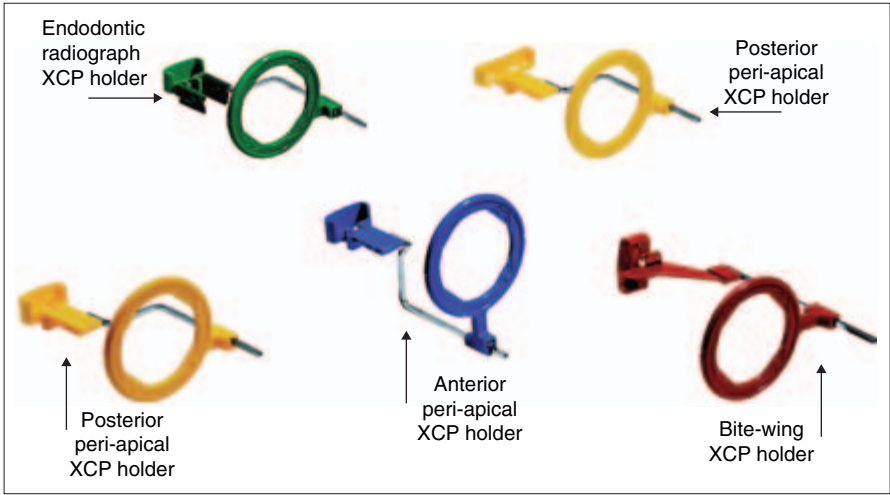


Figure 2.9



Figure 2.10

RADIOGRAPHIC ACCESSORIES AND EQUIPMENT**FIGURE 2.9****Name**

Extension cone paralleling (XCP) film holders

Functions

- To aid in film placement for intra-oral radiographs
- The holders shown in Figure 2.9 are for use with digital radiography; the holders for ordinary radiographic films are similar
- These XCP film holders are used with the paralleling technique
- A film holder helps to take the most accurate radiograph possible, reducing radiation exposure through retakes

Note: It is the duty of the dental team to minimise the amount of radiation exposure to the patient

Varieties

- Different film holders are available depending on the type of radiograph indicated and operator preference (e.g. styrofoam bite block, digital radiograph holders, Snap-A-Ray instrument)
- Check legislation and local rules in your area to identify which film holders are acceptable

FIGURE 2.10**Name**

X-ray viewer

Function and labelling of films

- Used with a light source to view patient radiographs
- All radiographs must be placed in film mounts and labelled with the patient's name, date, operator's name and chart number (if applicable)

Varieties

Many varieties of X-ray viewers and film mounts are available from different manufacturers

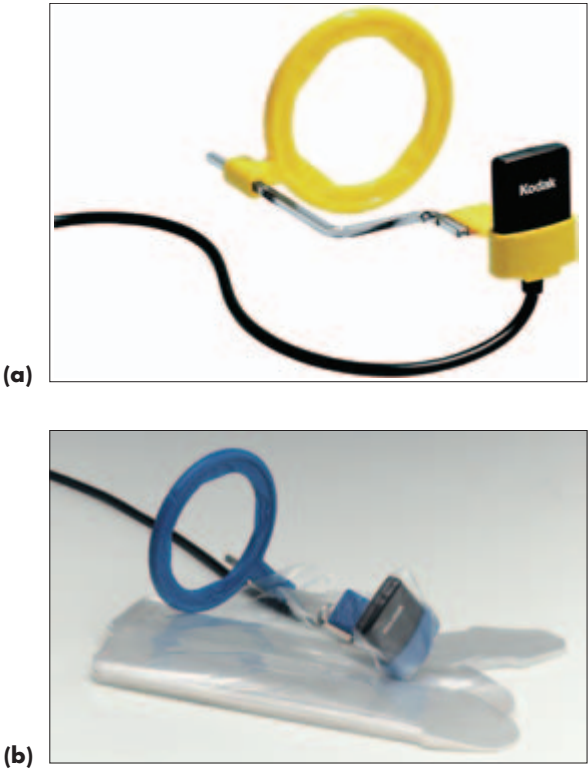


Figure 2.11



Figure 2.12

FIGURE 2.11 a, b**Name**

Digital radiography aids (a) Sensor in an XCP film holder (b) Barrier wrapped around sensor and XCP film holder

Functions

- A way to produce a filmless radiographic image
- A sensor is used instead of a film
- As sensors cannot be sterilised, a non-permeable barrier must be placed over the sensor and XCP film holder (see Figure 2.11b and Section 1)

The digital radiographical image is viewed on a computer screen and stored in the computer. It is easily retrieved.

Varieties

There are many manufacturers of digital radiography equipment

FIGURE 2.12 a, b**Name**

(a) Intra-oral X-ray machine (b) Extra-oral X-ray machine

Functions

- Intra-oral X-ray machines are used for exposing occlusal, peri-apical and bite-wing radiographs
- Extra-oral X-ray machines are used for exposing panoramic/OPG radiographs and cephalometric radiographs

Varieties

Machines from different manufacturers may vary in design



Figure 2.13

Film holder and X-ray tube placed in position to expose an anterior peri-apical radiograph



Figure 2.14

FIGURE 2.13**Name**

Automatic processor

Function and precautions

- Film processing includes the steps taken to make a latent (non-visible) image visible
- The automatic processor shields the radiograph from light, which can cause artefacts and adversely affect processing while the rollers carry the film through the solutions and the dryer
- Developer and fixer chemicals are contained within the automatic processor and should be handled wearing protective equipment
- Follow the manufacturer's instructions for use of the processor
- Dispose of chemicals according to your local health and safety guidelines

Varieties

- Radiographs are transported through the processor usually by rollers or conveyors
- Radiographs can be processed by the manual method

! The following items relate to health and safety in radiography. Check
• local legislation and guidelines in your area, as these differ between countries.

FIGURE 2.14**Name**

Lead apron and thyroid collar

Function and precautions

- A lead apron and thyroid collar must be used to protect the patient from radiation during X-ray procedures
- The lead apron is used with a thyroid collar that must cover the radio-sensitive tissues (from the thyroid downwards and including the lap area)
- The lead apron must be hung up, not folded because folding the apron will cause the lead inside to crack, causing radiation to pass through

Varieties

Different styles available from various manufacturers



Figure 2.15

FIGURE 2.15**Name**

Dosimeter/radiation monitoring badge

Function and directions for use

- Used to measure level of radiation received by an individual
- Monitored by local radiological board
- Aids in quality assurance process by monitoring safety of X-ray units
- Badge needs to be worn around the hip area and sent back to the radiological board to read dosage levels
- Each individual should be allocated their own dosimeter/radiation monitoring badge, as each individual needs to know their own dosage level

SECTION 3

BASIC INSTRUMENTS

There are a few basic instruments that are universal to almost every procedure in dentistry.



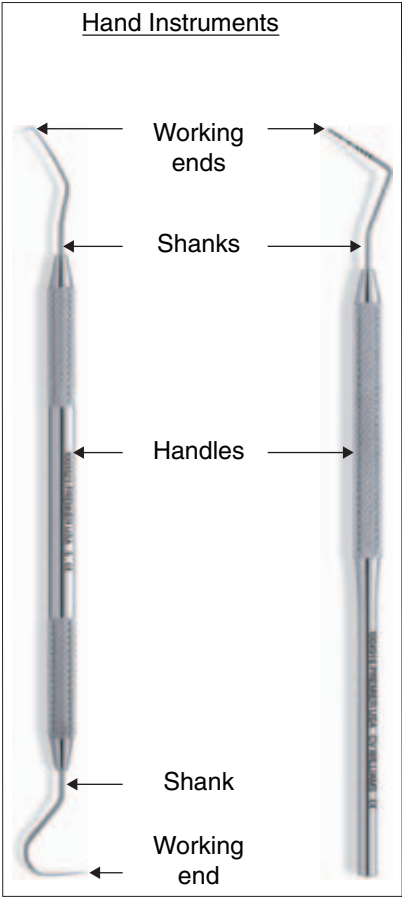


Figure 3.1



Figure 3.2

GENERAL FEATURES OF DENTAL INSTRUMENTS

FIGURE 3.1

Working end(s) of instruments

- Are the functional parts of the instrument
- Can have a variety of functions including: cutting, packing, carving, placing and condensing
- Are adapted to the function of the particular instrument
- May be bevelled (i.e. the working end is cut at an angle)
- An instrument can be single-ended (one working end) or double-ended (two working ends)

Shank of an instrument

- The part between the working end and the handle
- Can be straight or angled
- The function of the instrument determines the angle and flexibility of the shank

Handle of an instrument

- Is the part of the instrument that the operator grasps
- Provides stability and leverage
- Design is related to the function of the instrument
- Examples:
 - The handle of an upper extraction forceps may be curved to facilitate a palm grasp for the operator
 - The handle of a rubber dam clamp forceps is rounded to fit in the palm of the operator's hand
 - A serrated handle allows a better grip
 - A large handle allows a palm grasp

THE BASIC DENTAL INSTRUMENTS

FIGURE 3.2

Name

Mouth mirror and handle

Functions

- To provide indirect vision
- To reflect light
- For retraction and protection of oral tissues
- For magnification (the number of the mirror represents size of mirror head)

Varieties

- Single-sided or double-sided
- Can be disposable
- Plain or magnifying

(a)



(b)



Figure 3.3



Figure 3.4

FIGURE 3.3 a, b**Name**

(a) Sickle/contra-angled probe (b) Nabers probe

Functions

- Detection of:
 - defective pits and fissures
 - calculus
 - deficient margins of restorations, crowns and bridges
 - caries
- Examination (pointed tip allows good tactile sensitivity)

Varieties

- Can be single-ended or double-ended
- Many different styles available
- Working ends may vary (straight, curved)

False friends

Periodontal probe, endodontic probe (DG16 probe), lateral condenser

FIGURE 3.4**Name**

Periodontal probe

Function and features

- Measure the depth of periodontal pockets
- Tip is calibrated in millimetres
- Blunt end reduces the possibility of tissue trauma

Varieties

- Single-ended or double-ended
- Can be straight, curved or at right angles
- Plastic types available

False friends

Sickle/contra-angled probe/sickle probe, endodontic probe/DG16 probe and endodontic spreader



Figure 3.5



Figure 3.6

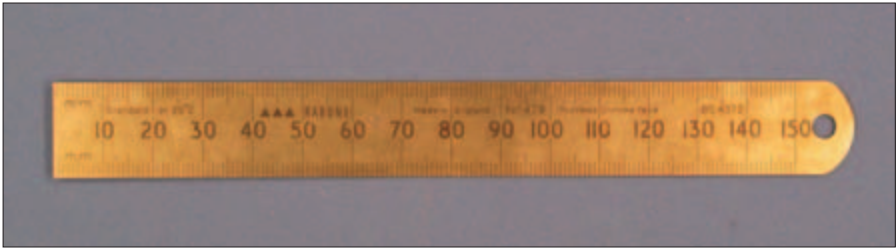


Figure 3.7

FIGURE 3.5**Name**

Briault probe

Function and feature

- Detection of caries on mesial and distal surfaces
- The angled working ends facilitate adaptation to interproximal surfaces

False friend

Furcation probe

FIGURE 3.6 a, b**Name**

(a) College tweezers (b) Locking college tweezers

Functions

- Placing small objects in the mouth and retrieving small objects from the mouth
- Locking type 'lock' to prevent dropping materials

Varieties

- Locking and non-locking types
- Working ends can be straight, curved, serrated or smooth

False friends

Tissue dissecting forceps, toothed dissecting forceps

FIGURE 3.7**Name**

Metal ruler

Function

Measurement of length, e.g. endodontic K files

Varieties

- Can be calibrated in different units of measure
- Plastic type available

Set-up

Examination

- Mouth mirror and handle
- Sickle/contra-angled probe
- College tweezers

Optional: Briault probe, metal ruler and periodontal probe

SECTION 4

INSTRUMENTS AND SUNDRIES USED IN MOISTURE CONTROL

Properties of dental materials can be altered by moisture. The dental team can use specific instruments and sundries to aid in moisture control.



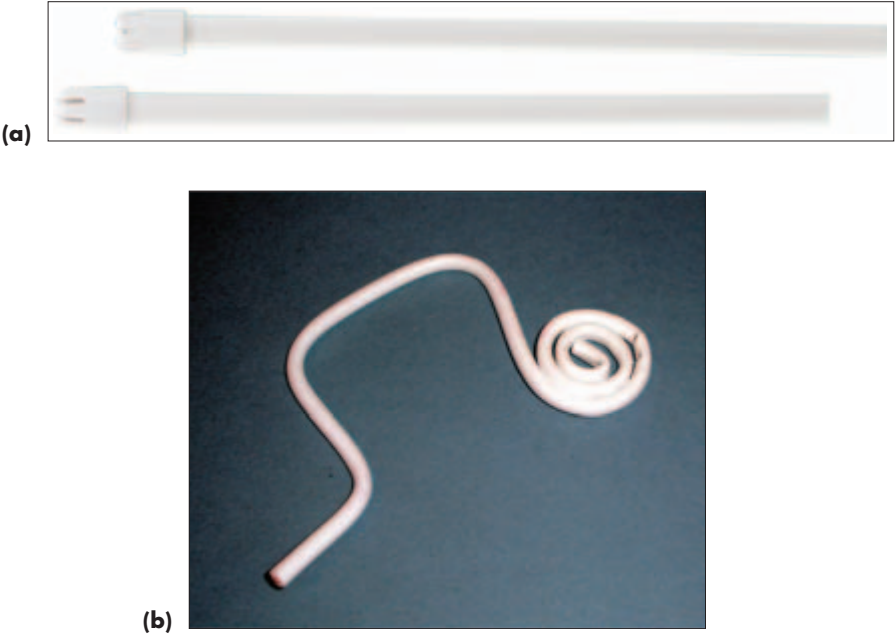


Figure 4.1



Figure 4.2

FIGURE 4.1 a, b**Name**

Disposable saliva ejector/Low volume suction

Function and features

- Low volume evacuation of the mouth
- Are more tolerated by the patient
- Plastic types are disposable and flexible – to suit clinical need

Varieties

- Metal or plastic
- Plastic ones come in a variety of colors and shapes and can be adapted for particular uses

FIGURE 4.2**Name**

High volume suction tip

Functions

- High volume evacuation of the mouth
- Retraction and protection of tissues
- Reduction of aerosols created by handpieces

Varieties

- Metal (autoclavable), plastic (autoclavable or disposable – check manufacturer's instructions)
- Various lengths, shapes and sizes



Figure 4.3



Figure 4.4

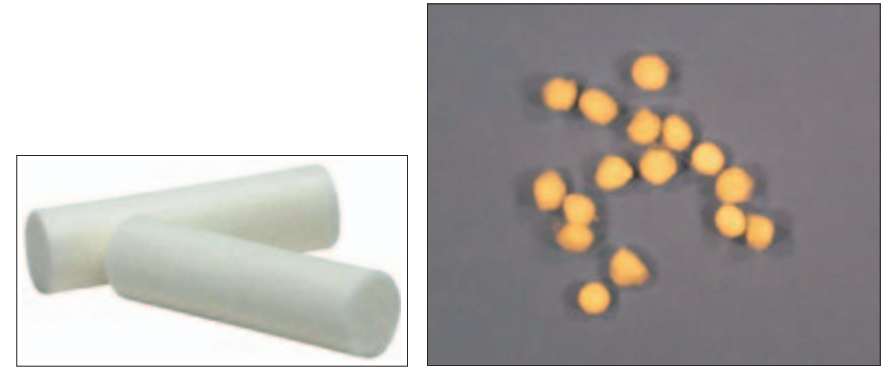


Figure 4.5

FIGURE 4.3 a, b, c**Name**

Garmer cotton wool roll holders

Functions

- Moisture control
- Hold cotton rolls against the buccal and lingual surfaces (mandibular teeth)
- Retract cheek and tongue

Varieties

Separate holders for left and right sides

FIGURE 4.4 a, b**Name**

Disposable dry aid/dry guard

Functions and directions for use

- Moisture control
- Absorb excess saliva
- Place close to the opening of the parotid salivary duct

Varieties

Made from a variety of materials, e.g. cardboard or an absorbant material enclosed in a plastic cover

FIGURE 4.5 a, b**Name**

(a) Disposable cotton wool rolls (b) Cotton pellets

Functions

- Moisture control – absorb saliva, blood or excess dental materials
- Can be used to deliver materials to and from the mouth

Varieties

Various sizes available



Figure 4.6

FIGURE 4.6**Name**

Metal air/water syringe or referred to as 3-in-1 syringe

Functions and parts

- Provides spray of air, water, or a combination of both
- Retraction
- Has a handle, controls and a tip (tip can be metal or plastic)

Varieties

- Different angled tips available for ease of access
- Can have plastic disposable tips for infection control purposes

Set-up

Fissure sealants

- Mouth mirror and handle (p. 33)
- Sickie/contra-angled probe (p. 35)
- College tweezers (p. 37)
- Disposable saliva ejector
- Garmer cotton wool roll holders (mandibular sealants)
- High volume suction/low volume suction
- Prophy handpiece (p. 71)
- Bristle brush (p. 81) and rubber cup (p. 80)
- Flour of pumice to clean the tooth surface prior to sealant (do not use prophy paste as fluoride interferes with sealing procedure)
- Acid etch, sealant material
- Applicator brush (p. 87)
- Glass dappen dish (p. 91)
- Curing light (p. 105)

SECTION 5

LOCAL ANAESTHESIA

Local anaesthetics provide temporary loss of sensation to a particular area of the mouth, so that the patient will not feel pain.



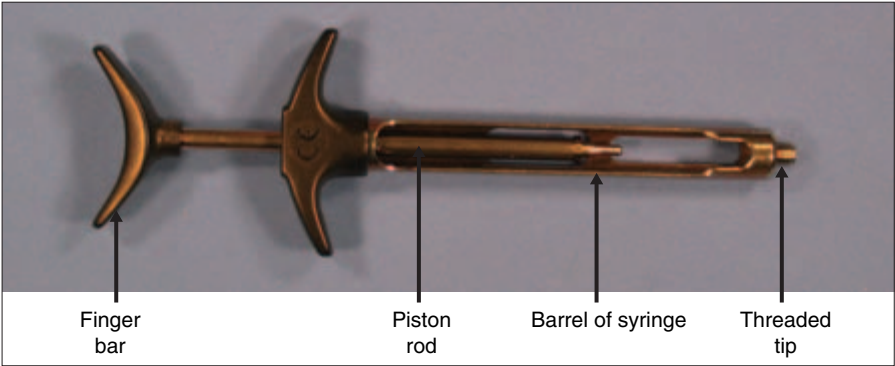
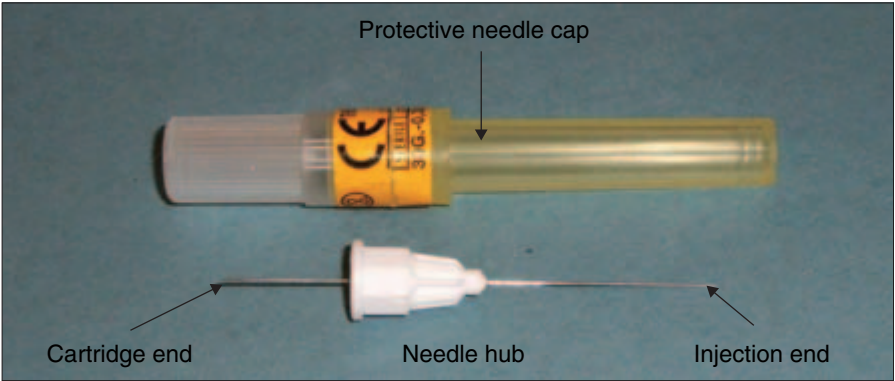


Figure 5.1



(a)



(b)

Figure 5.2

SYRINGES, NEEDLES AND CARTRIDGES

FIGURE 5.1

Name

Self-aspirating local anaesthetic syringe

Function and features

- Used to administer local anaesthetic with a disposable anaesthetic cartridge and a disposable needle
- The finger bar of the syringe controls the piston rod, which depresses the rubber stopper of the anaesthetic cartridge during aspiration
- When the piston rod is depressed, the local anaesthetic solution is forced out through the disposable needle, which is screwed onto the threaded tip
- The barrel of the syringe is open on both sides to facilitate loading the anaesthetic cartridge and check for blood cells during aspiration

Variations

Non-self-aspirating type, disposable type (assembled), top loading type, intraligamentary syringe

False friends

Irrigation syringe, endodontic syringe

FIGURE 5.2 a, b

Name

Disposable needle

Function, features and precautions

- Used in conjunction with a self-aspirating local anaesthetic syringe and disposable local anaesthetic cartridge
- Is threaded onto the hub of syringe – the short end of needle punctures the rubber diaphragm of the cartridge
- Single use
- Disposed of in the sharps' container
- Prior to use, check: seal is intact, expiry date and the length and gauge of the needle
- Lumen is the hollow centre of the needle
- Gauge is the thickness of the needle
- The type of injection dictates the appropriate length and gauge of needle to be used

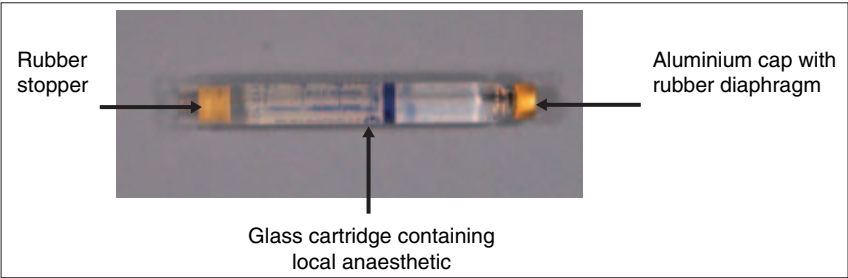
Varieties

Available in different lengths and gauges

False friends

Irrigation syringe needle, endodontic syringe needle

(a)



(b)



Figure 5.3

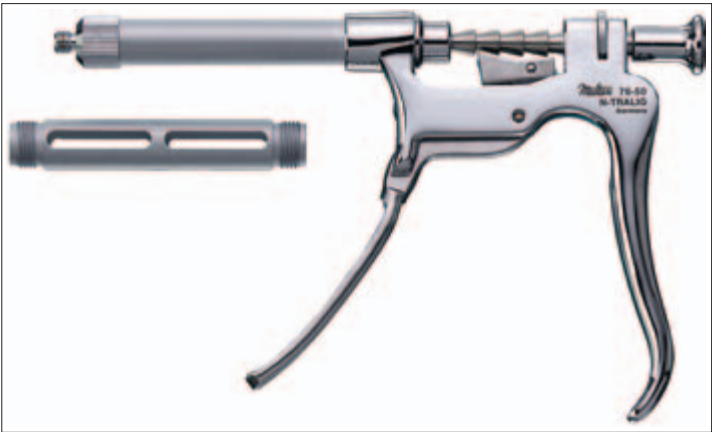


Figure 5.4

FIGURE 5.3 a, b**Name**

Glass disposable local anaesthetic cartridge

Function, precautions and contents

- Contains local anaesthetic solution for delivery
- Prior to use check: expiry date, cartridge and rubber diaphragm are intact and the colour of the local anaesthetic solution
- Single use
- Disposed in the sharps' container
- Contains water, preservatives, anaesthetic solution and buffering agents; some contain vasoconstrictors

Varieties

- Local anaesthetic constituents may vary
- May be presented in a plastic cartridge

FIGURE 5.4**Name**

Intraligamentary syringe

Functions and directions for use

- Used to deliver a small amount of local anaesthetic to a localised area
- A short or ultra-short needle is used with this syringe

Varieties

Different types of syringes available depending on the manufacturer

(a)



(b)



Figure 5.5



Figure 5.6

FIGURE 5.5 a, b**Name**

Safety syringes (a) Safety self-aspirating syringe (b) Safety intraligamentary syringe

Functions and features

- Sterile, single-use syringe with an autoclavable handle
- A plastic sheath is used to cover the needle when not in use
- Designed to reduce the number of percutaneous injuries

Varieties

Different types of syringe available

SHARPS' WASTE MANAGEMENT**FIGURE 5.6****Name**

Needle stick protector

Function(s)

- A sturdy holder that holds the needle cap to facilitate safe recapping of the needle
- Designed to prevent percutaneous injuries
- A needle stick protector is not required if using the one-handed bayonet technique

Varieties

Many different types of needle stick protectors are available



Figure 5.7

FIGURE 5.7**Name**

Sharps' disposal container

Functions, features and directions for use

- To safely dispose of sharps'
- Must be puncture proof, closable, leak proof and colour coded
- Sharps' disposal containers should be placed close to work areas to prevent having to transport disposable sharp items
- Items suitable for disposal in these containers include: scalpels, matrix bands, needles, carpules, orthodontic wires, burs and endodontic files

! Check your local health and safety guidelines for requirements of sharps' disposal in your area

Set-up

Local anaesthetic

- Preferred type of local anaesthetic syringe
- Disposable local anaesthetic cartridge
- Disposable needle in desired length and gauge
- Needle holder (in case of needle breakage in the mouth) (p. 175)
- Topical anaesthetic
- Topical anaesthetic applicator
- Disposable saliva ejector (p. 41)

Optional: Special device for safe recapping of the disposable needle (only needed if not using the one-handed bayonet technique)

SECTION 6

INSTRUMENTS USED FOR RUBBER DAM PLACEMENT

A rubber dam is a thin sheet of material that is used to isolate the desired tooth or teeth to:

- aid moisture control
- protect the patient's airway
- aid operator visibility and access
- reduce aerosols caused by the air turbine handpiece
- provide patient comfort by reducing the amount of water and materials in the mouth



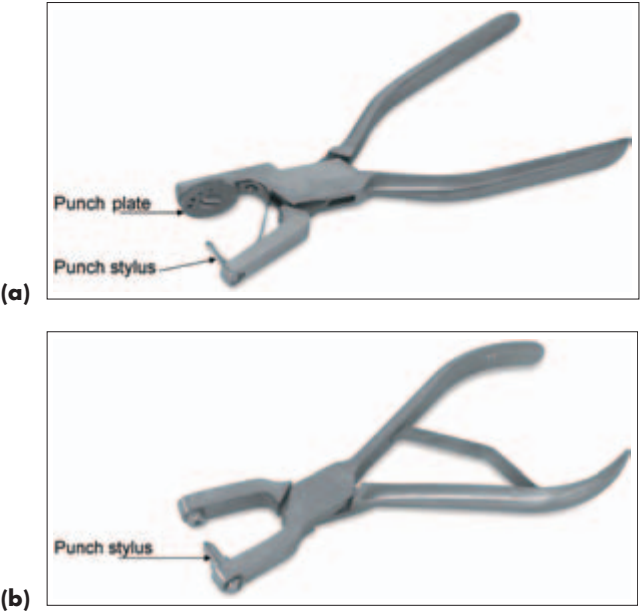


Figure 6.1

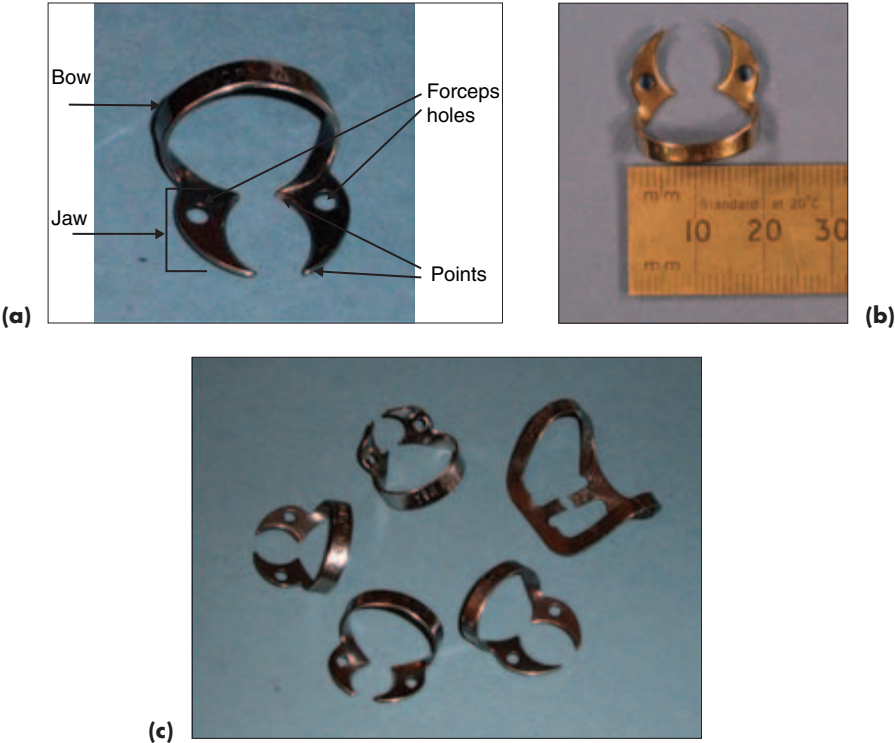


Figure 6.2

FIGURE 6.1 a, b**Name**

Rubber dam punch

Functions

- Used to make holes of different sizes in the rubber dam sheet
- Size and position of the teeth to be isolated determines the orientation of the punched holes
- Punch stylus pierces a hole in the rubber dam sheet
- When the handle of the rubber dam punch is closed, the punch stylus meets the punch plate, which has serrated edges, to create a 'clean' punch

Varieties

- Available in various styles depending on the manufacturer
- In some styles, the punch stylus and plate can be replaced when they become dull (according to the manufacturer's specifications)

FIGURE 6.2 a, b, c**Name**

Rubber dam clamps

Functions and parts

- Used to stabilise and secure the rubber dam sheet during treatment
- Usually made from chrome- or nickel-plated steel – autoclavable
- Bow – rounds over the tooth. Varies between clamps and is flexible so that the clamp can have a firm hold on the tooth
- Jaw – the part of the rubber dam clamp that holds it firmly around the cervical portion of the tooth (pointed). Can be serrated for retention or smooth to prevent tissue trauma, and can be curved to fit subgingivally
- Forceps hole – where the rubber dam clamp forceps attach to the clamp for placement. Where a piece of floss can be tied to, in case of accidental displacement (the floss should be tied to both holes in case the bow breaks)

Varieties

- Various types, sizes and shapes (see figure for examples) available to use with teeth of different shapes
- Various degrees of flexibility

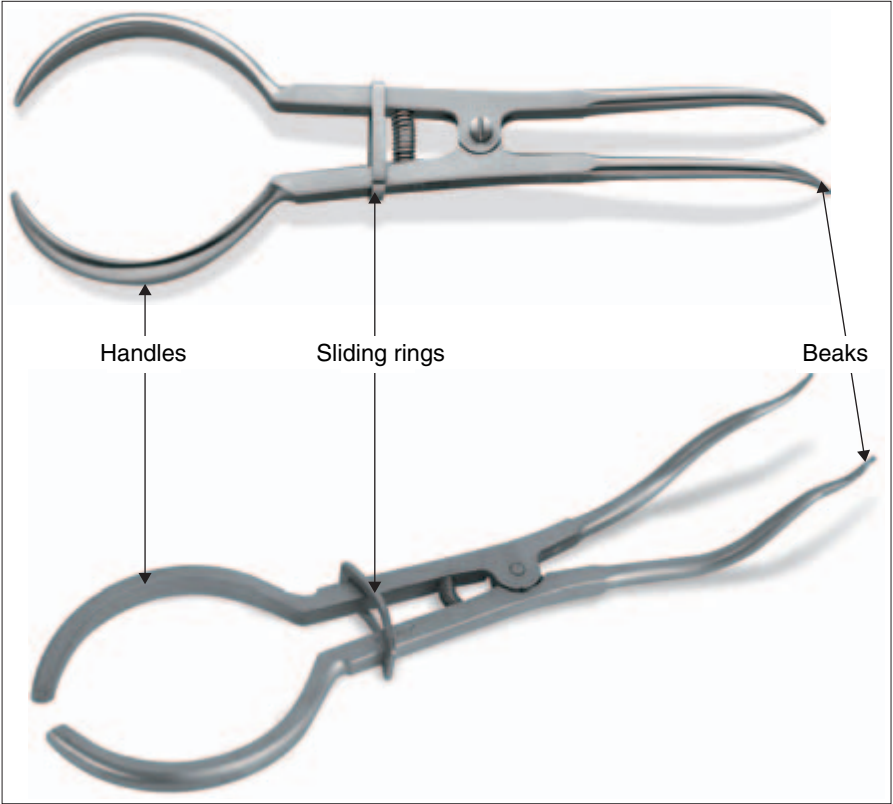


Figure 6.3



(a)

Figure 6.4

FIGURE 6.3**Name**

Rubber dam clamp forceps

Functions and features

- Used to place and remove rubber dam clamps on and from a tooth
- Work with a spring action when handles are squeezed together
- Beaks – fit into the holes of the rubber dam clamp for secure placement
- Sliding ring – allows forceps to lock when placing the clamp and to be released when removing the clamp
- Handle – shaped to allow a firm palm-grasp by the operator

Varieties

- Available in various styles depending on the manufacturer

False friends

- Coon ligature pliers, separator placing pliers

FIGURE 6.4 a, b**Name**

Rubber dam frame (a) Metal type (b) Plastic type

Function and feature

- Used to stretch the rubber dam to maintain a clear working area in the patient's mouth
- The rubber dam frame has extensions around which the rubber dam material is held

Varieties

- Available in various styles
- Can be made of different materials (e.g. metal, plastic)



Figure 6.4 (Continued)

(b)

(a)



(b)

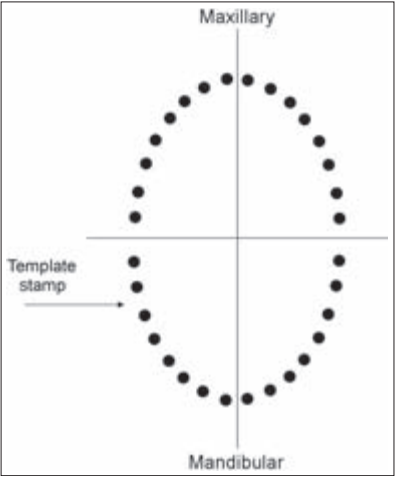


Figure 6.5

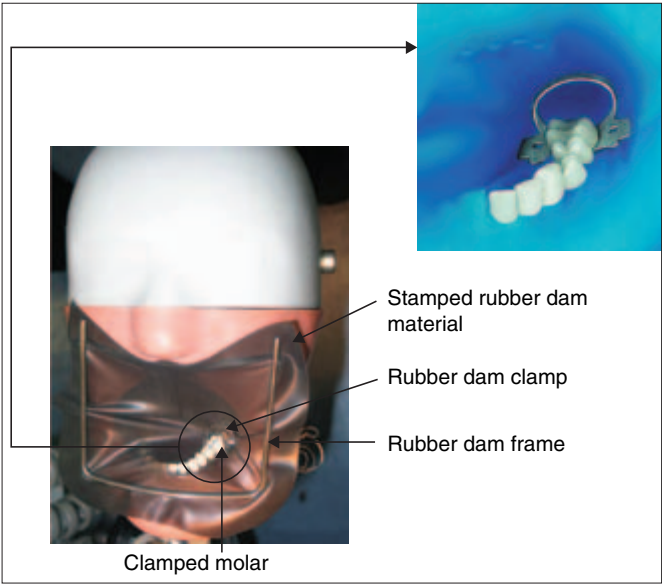


Figure 6.6

FIGURE 6.5 a, b**Name**

Rubber dam material (6.5a)

Functions and directions for use

- A thin sheet of latex or non-latex that aids with moisture control, infection control, airway protection, tissue and tongue retraction, patient comfort and operator visibility during treatment
- Is stretched around the rubber dam clamp seated in the mouth
- Can isolate one or many teeth depending on the procedure
- Waxed dental floss may be used to fit the rubber dam into the interproximal spaces of the tooth or teeth to be isolated
- May be stamped with a template (6.5b) to assist in punching the rubber dam

Varieties

- Various sizes and colours
- Various thicknesses
- Various materials

FIGURE 6.6

Mannequin with rubber dam in place

Set-up

Set-up for placement of rubber dam

- Rubber dam material in desired thickness, stamping template
- Rubber dam punch
- Rubber dam clamp forceps
- Selected rubber dam clamps
- Rubber dam frame
- Blunt scissors/‘Beebee’ crown scissors/shears (p. 109)
- Flat plastic instrument or another choice of blunt instrument (to help orientate rubber dam without puncturing) (p. 91)
- Dental floss
- Gauze or napkins
- Lubricant (to aid in stretching the rubber dam material over the rubber dam clamp)
- Stabilising ligatures

SECTION 7

HANDPIECES, BURS AND ROTARY ATTACHMENTS

Dental handpieces and rotary attachments help to make dental treatment more comfortable for the patient and reduce the amount of time needed to complete procedures.





Figure 7.1

HANDPIECES

FIGURE 7.1

Name

Air turbine handpiece. Also called: fast handpiece, high speed handpiece, air rotor handpiece

Type

Contra-angled

Functions, precaution and features

- Removal of tooth tissue during restorations and preparation of teeth for fixed prosthetic appliances
- Polishing of restorations
- High speeds create heat and friction – handpiece must be run with water to cool the tooth to prevent pulpal damage
- High speed saves treatment time and reduces vibration
- High speed but low torque handpiece will stall with moderate pressure

Driven by

- Turbine – may need to be lubricated – check manufacturer's instructions
- Compressed air rotates the turbine, which then rotates the bur

Speed

Check manufacturer's specifications (can run up to 500 000 rpm)

Grip

Accepts friction grip attachments

Attachment

Dental unit

Varieties

- Different types of chucks available (e.g. those which need bur changing tool)
- With or without light
- Smaller heads for difficult access or use with the paediatric patient



Figure 7.2



Figure 7.3

FIGURE 7.2**Name**

Straight handpiece

Type

Straight

Functions

- Used in surgical procedures to remove bone (cannot use air turbine as the water is not sterile)
- Used extra-orally at chairside or in the dental laboratory (e.g. for denture adjustments)

Driven by

Gears

Speed

Check manufacturer's specifications (can run up to 40 000 rpm)

Grip

Accepts long shank attachments

Attachment

Electric motor that fits into the base of the handpiece

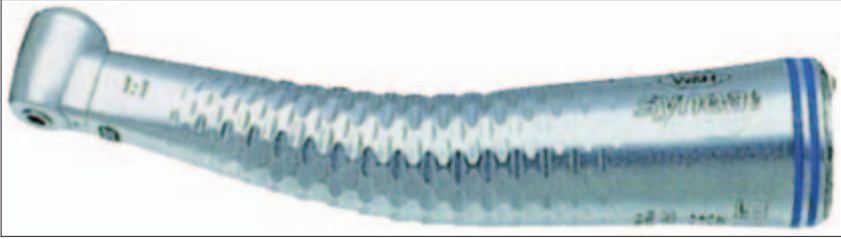
FIGURE 7.3**Name**

Electric motor

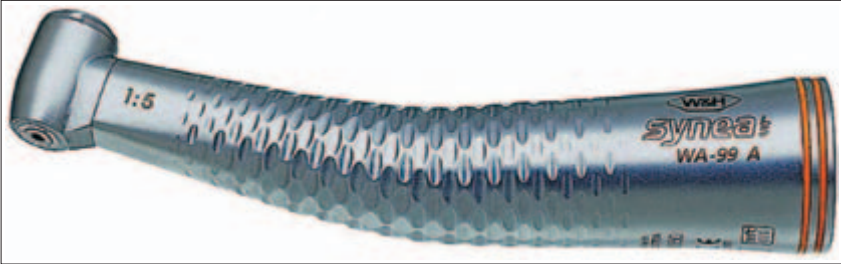
Features

- Can reach speeds of 100 000 rpm depending on the type of attachment
- It is attached to the dental unit

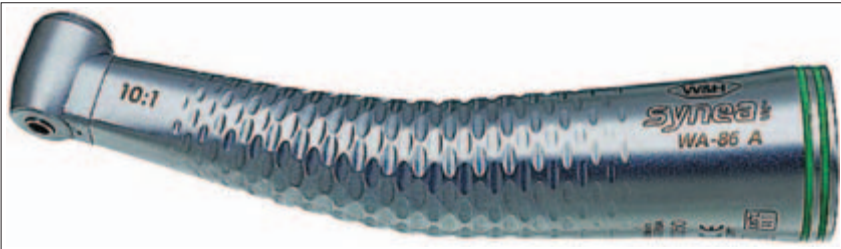
(a)



(b)



(c)



(d)

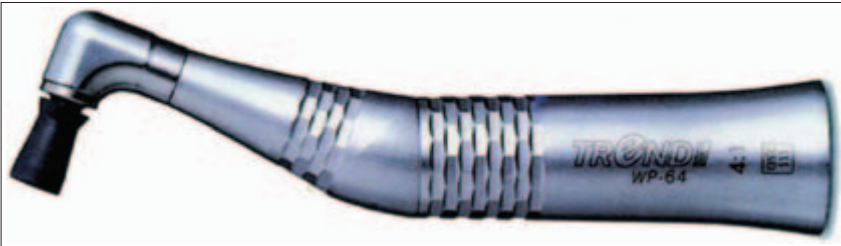


Figure 7.4

FIGURE 7.4 a, b, c, d, e, f**Name**

Conventional handpieces. Also called: slow speed handpieces, low speed handpieces

Type

Contra-angled

Functions

- Removal of caries
- Polishing
- Procedures that require torque
- Refine cavity preparations and adjust occlusion

Driven by

Gears

Speed

Varies depending on handpiece

Grip

Varies depending on handpiece

Attachment

Electric motor that fits into the base of the handpiece (see Figure 7.3)

Examples of conventional handpieces

Blue ring conventional handpiece (Figure 7.4a)

- Runs at the speed of the motor (up to 40 000 rpm)
- Accepts latch grip attachments
- Can have a latch chuck rather than a push type chuck

Orange ring conventional handpiece/variable speed handpiece (Figure 7.4b)

- Runs faster than the speed of the motor
- Accepts friction grip attachments

Green ring conventional handpiece/speed reducing handpiece (Figure 7.4c)

- Runs 10 times slower than the speed of the motor
- Accepts latch grip attachments

Prophy conventional handpiece (Figure 7.4d)

- Runs at the speed of the motor (40 000 rpm)
- Accepts screw type attachments
- Available with attachable, disposable prophy head (see pp. 248 and 249)

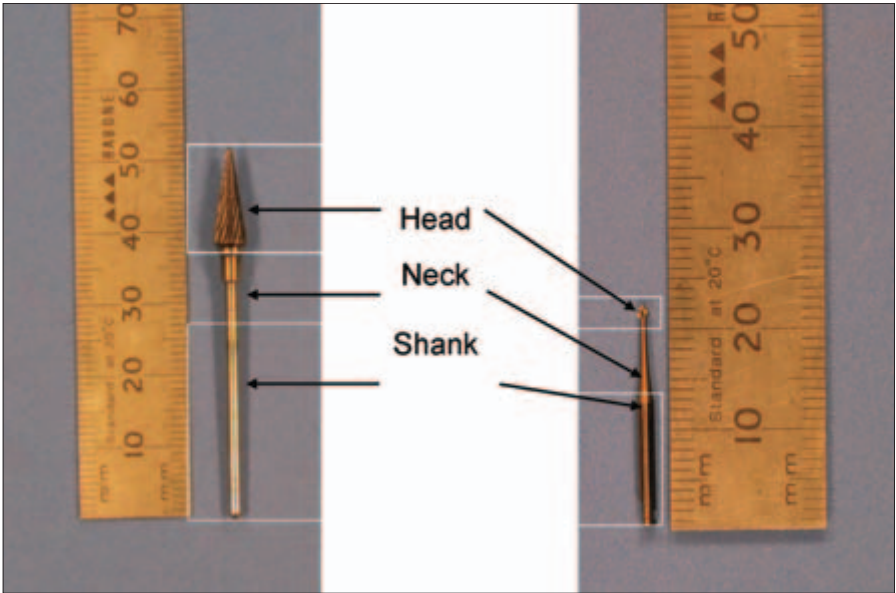
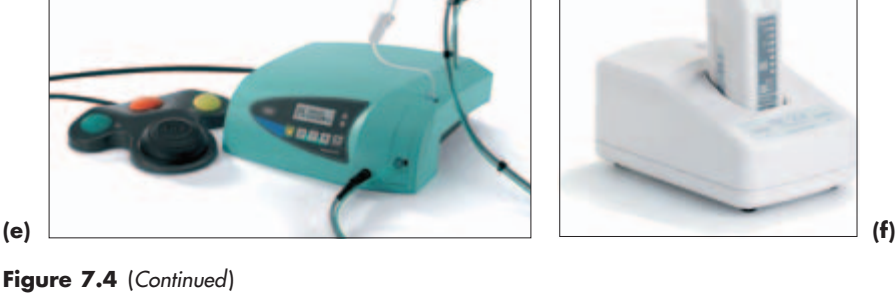


Figure 7.5

Electric surgical and implant handpiece unit (Figure 7.4e)

- Runs at speeds of 40 000 rpm (varies with different handpieces)
- Can be used with straight and contra-angled handpieces for implant and maxillo-facial surgery procedures
- Runs in conjunction with flowing sterile water during procedures

Endodontic handpiece (Figure 7.4f)

- Able to adjust the speed of the handpiece to run at very low speeds
- Used with specialised nickel-titanium rotary files to clean and shape root canals
- Handpiece in the illustration is a cordless handpiece with the motor in the unit, also available with separate unit

BURS AND ROTARY ATTACHMENTS

FIGURE 7.5

Enlarged view

Parts

Head

- This is the working end
- Function depends on the size and shape of the head
- Many different sizes and shapes, each used for a different function (cutting, polishing and finishing)

Neck

- The part that connects the head to the shank – usually narrows towards the head

Shank

- The part that fits into the handpiece
- Shapes and lengths vary, depending on function
- Can sometimes be marked to identify bur type (stripes or coloured bands)

Some points to remember about rotary attachments and burs

- Most often called burs, but also available are wheels, discs, rubber points, rubber cups and stones
- Each has a particular function (cutting, polishing, finishing or caries removal)
- Are made from various materials (tungsten carbide, diamond and steel)
- Can have flutes (the cutting edges)
- The end of the shank determines which handpiece the attachment will fit into:
 - Long straight shank – straight handpiece
 - Latch grip – conventional type/slow speed handpiece
 - Friction grip shank – air turbine handpiece/high speed handpiece
 - Other various attachments such as snap or screw-type attachments

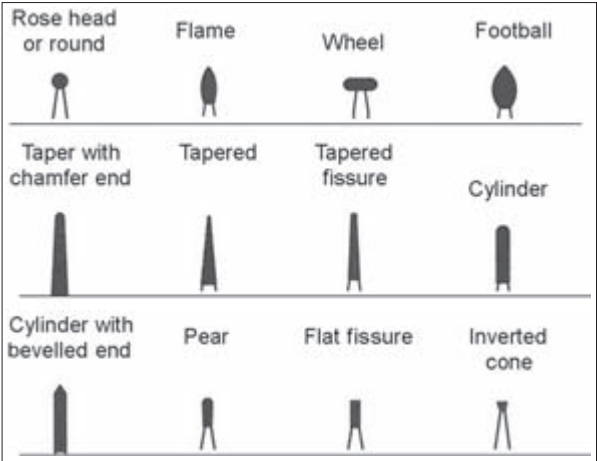


Figure 7.6

Bur				
Grip	Latch grip	Friction grip	Long shank	Screw type
Handpiece	Conventional	Air turbine	Straight	Prophy

Figure 7.7



Figure 7.8

FIGURE 7.6

Some common shapes of dental burs

How to name and describe a dental bur

Five key characteristics:

- (1) Grip of shank
- (2) Composition of head
- (3) Shape of head
- (4) Function
- (5) Handpiece that it fits

Grip and corresponding handpiece

Refers to the way the bur's shank is 'gripped' into the handpiece (Figure 7.7)

Composition

- Refers to the head of the bur and what it is made from
- Generally:
 - Most latch grip burs are made of steel
 - Most friction grip burs are made of tungsten carbide or diamond
 - Most long shank burs are made from steel if they are meant for surgical procedures and stainless steel if they are meant for laboratory purposes

Shape and function

Shape determines function; the examples that follow relate to tungsten carbide burs:

- Rose head/round – cutting and removing caries
- Pear – to shape the cavity preparation
- Fissure – to shape and prepare the cavity preparation

Some examples follow.

FIGURE 7.8

Friction grip bur

Description

Friction grip, tungsten carbide, fissure, cutting bur for the air turbine handpiece

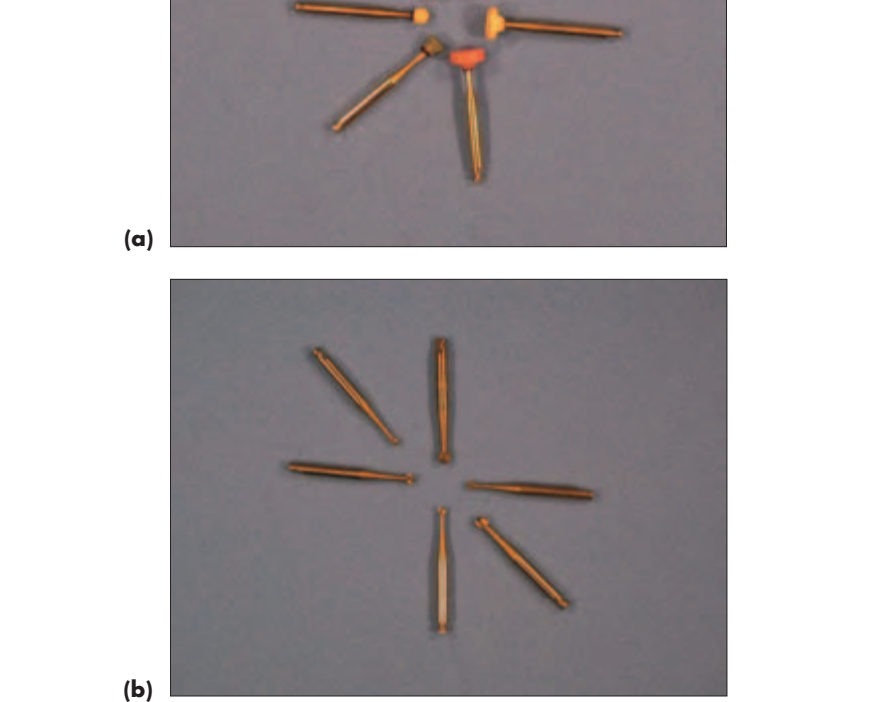


Figure 7.9



Figure 7.10

FIGURE 7.9 a, b

Latch grip burs

Description

- (a) Various shaped, latch grip, stone polishing burs for the conventional handpiece
- (b) Various sizes of rose head/round, latch grip, steel cutting burs for the conventional handpiece

FIGURE 7.10 a, b, c

Diamond burs

Description

Various shaped, friction grip, diamond cutting burs for the air turbine handpiece

HANDPIECES, BURS AND
ROTARY ATTACHMENTS



Figure 7.10 (Continued)

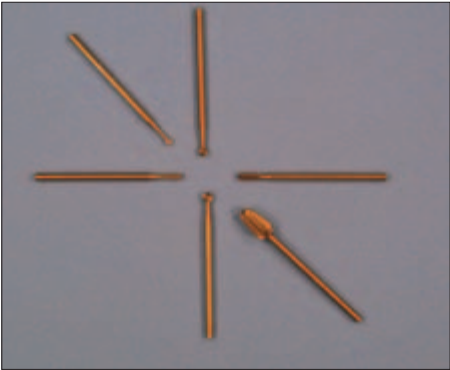


Figure 7.11



Figure 7.12

(a)



(b)

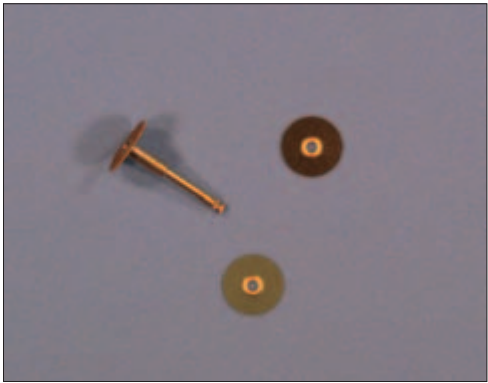


Figure 7.13

FIGURE 7.11

Long shank surgical burs

Description

Various shaped, long shank, steel cutting burs for the straight handpiece

FIGURE 7.12

Acrylic bur

Description

Used in laboratory procedures for cutting and trimming various materials. Available in many different shapes and sizes

- Illustration shows long shank, stainless steel, cone-shaped trimming bur for the straight handpiece

FIGURE 7.13 a, b

Mandrels

Description

Discs for polishing and cutting are fitted onto mandrels. Discs can be either screw-type (Moore mandrel and disc, Figure 7.13a) or pop-on-type (mandrel and pop-on discs, Figure 7.13b)

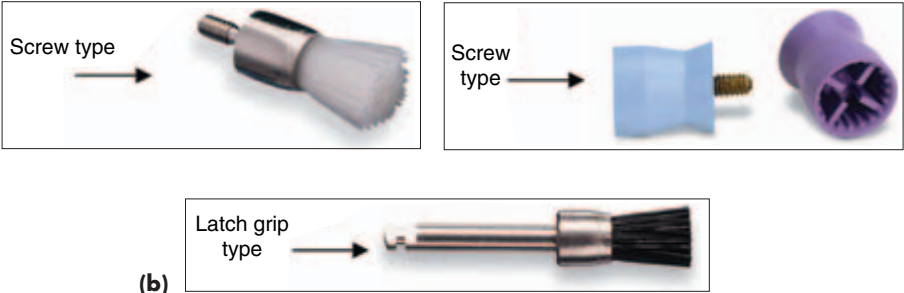
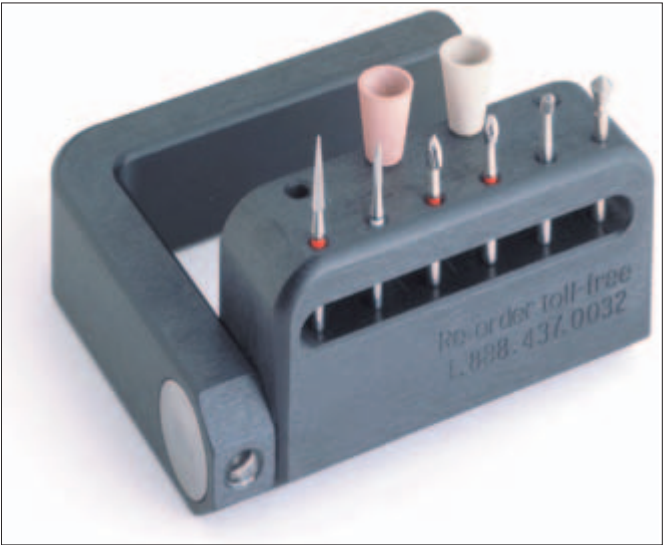


Figure 7.14



(a)



(b)

Figure 7.15

FIGURE 7.14 a, b, c

Bristle brushes (Figure 7.14a, b), rubber polishing cups (Figure 7.14c)

FIGURE 7.15 a, b**Name**

Bur blocks

Function and feature

- Used to organise and hold burs
- Some types are autoclavable

Varieties

- Different sizes and types available

SECTION 8

INSTRUMENTS USED IN BASIC RESTORATIVE PROCEDURES

Basic restorative procedures involve placement of restorations where tooth tissue has been removed for a variety of reasons (e.g. fractures, caries)



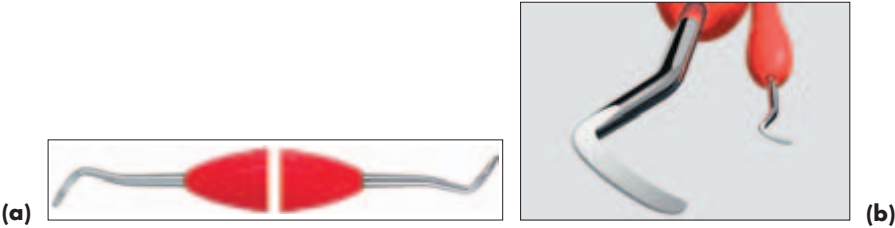


Figure 8.1

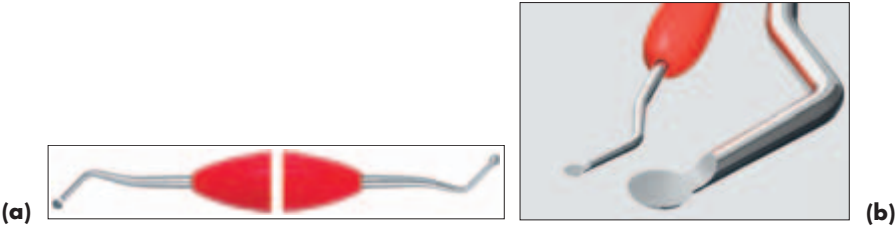


Figure 8.2

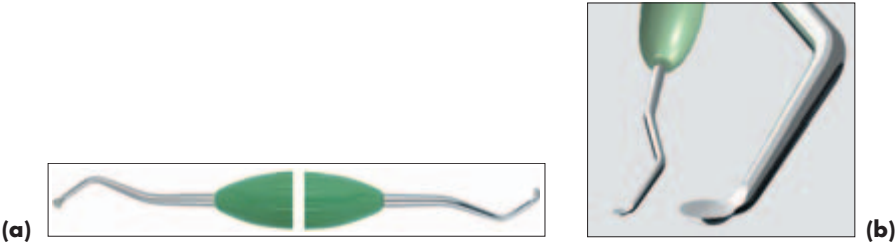


Figure 8.3

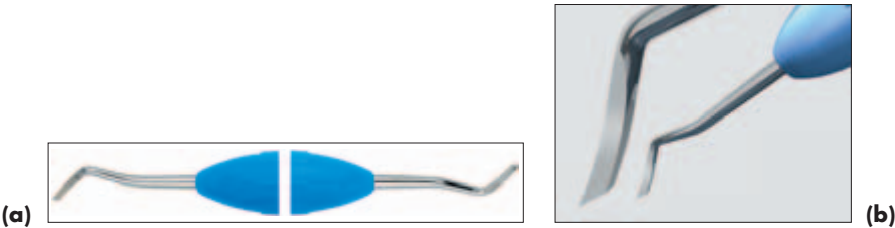


Figure 8.4

FOR ALL RESTORATIONS

FIGURES 8.1 a, b; 8.2 a, b; 8.3 a, b

Name

Spoon excavators

Functions and feature

- A spoon-shaped working end for 'spooning' out dentinal caries from the cavity preparation
- Edges of working end are sharp

Any remaining caries will be removed with the conventional handpiece and a round bur

Varieties

Various sizes and shapes of working ends – can be double-ended or single-ended

False friends

Cleoid discoid carver, spoon curette, ball burnisher

FIGURES 8.4 a, b; 8.5 a, b

Name

Gingival margin trimmers (Figure 8.4a, b) Distal (Figure 8.5a, b) Mesial

Function and feature

- Used to remove unsupported enamel for refining the cavity preparation
- Sharp bevelled working ends

False friends

Spoon excavator, Hollenback 3½ carver, Wards carver

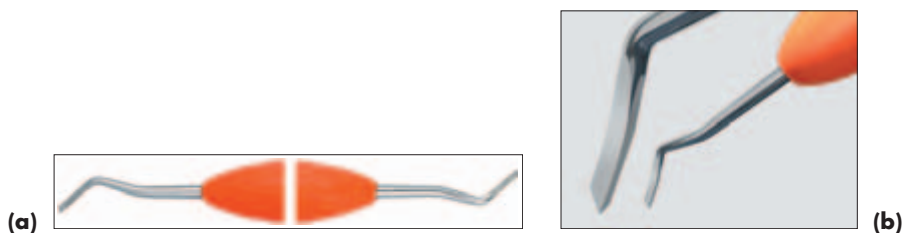


Figure 8.5

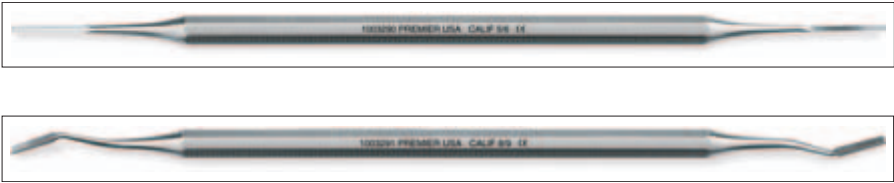


Figure 8.6



Figure 8.7

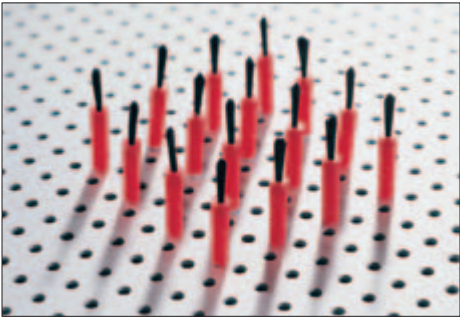


Figure 8.8

FIGURE 8.6 a, b**Name**

Enamel chisel

Function and feature

- Used to remove unsupported enamel for refining the cavity preparation
- Sharp bevelled working ends

Varieties

Various sizes and shapes available

False friends

Push scaler, ligature tucker

FIGURE 8.7**Name**

Enamel hatchet

Function and feature

- Used to remove unsupported enamel for refining the cavity preparation
- Working end is on the same plane as the handle

Varieties

Various sizes and shapes available

False friends

Push scaler, gingival margin trimmer, enamel chisel

FIGURE 8.8 a, b**Name**

Disposable applicators

Function(s):

- Used to apply materials intra-orally, e.g. desensitising agents, bonding agents, cavity varnish
- 8.8b are inserted into a plastic handle

Varieties

Many different types and shapes available



Figure 8.9



Figure 8.10



Figure 8.11

FIGURE 8.9**Name**

Calcium hydroxide applicator

Function

- Used to apply calcium hydroxide and other lining materials at the base of the cavity preparation

Varieties

Different sized working ends and long handles available

FIGURE 8.10 a, b, c**Name**

Mixing spatulas (a) Stainless steel Weston spatula (b) Stainless steel broad bladed spatula (c) Anodised aluminium spatula

Function and feature

- Used to mix dental materials
- Anodised aluminium spatula will not stick to any composite materials or discolour materials (8.10c)

Varieties

Different sizes, degrees of flexibility and shapes available

FIGURE 8.11**Name**

Dispensing wells

Function

- Used to hold material to be dispensed (e.g. bonding agent)

Varieties

- Available in various shapes and sizes
- Available with a small orange shield over dispensing hole to protect dispensed materials from light
- Available as disposable type

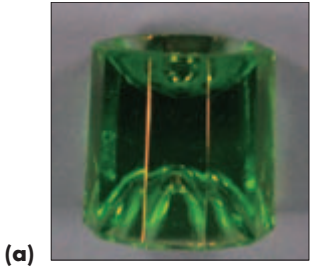


Figure 8.12



Figure 8.13



Figure 8.14

FIGURE 8.12 a, b**Name**

(a) Glass dappen dish (b) Disposable plastic dappen dishes

Function

To hold materials for dispensing

Varieties

Various shapes, sizes and colours available

FOR AMALGAM RESTORATIONS**FIGURE 8.13****Name**

Flat plastic instrument. Also called: plastic instrument

Functions

- To deliver materials to the cavity preparation
- To remove excess materials

Varieties

- Various sizes and shapes available
- Can be single-ended or double-ended

False friends

Spoon excavator, Hollenback 3½ carver, Wards Carver

FIGURE 8.14 a, b**Name**

(a) Metal amalgam carrier (b) Plastic amalgam carrier

Function, features and precaution

- Used to pick up, transport and place amalgam into the cavity preparation
- Working end is hollow
- A plunger/lever pushes amalgam out from working end into the cavity preparation
- The working end is sometimes Teflon® coated so the amalgam will not stick
- Care must be taken to expel the excess amalgam or it will set inside the working end
- Sterilisation procedures may vary depending on the material that the amalgam carrier is fabricated from

Varieties

- Various delivery methods
- Various sizes of working ends for different amounts of amalgam needed
- Can be single-ended or double-ended

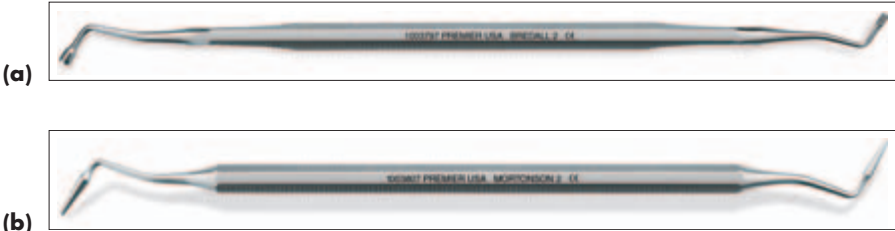


Figure 8.15

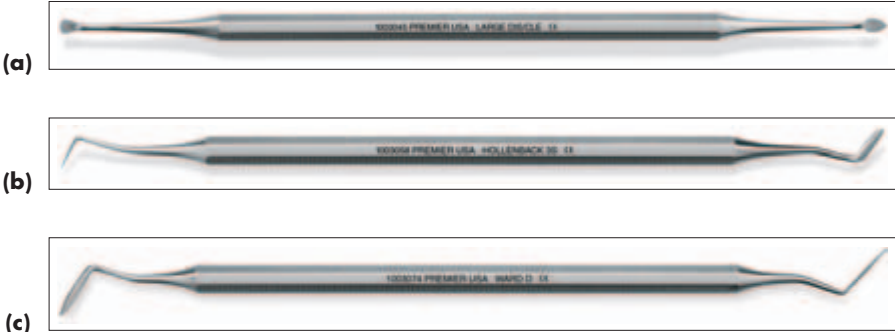


Figure 8.16

FIGURE 8.15**Name**

(a) Universal Hobsons plugger (b) Mortonson-Clevedent plugger

Family

Amalgam pluggers/condensers

Function and feature

- To pack and condense amalgam into a cavity preparation
- Working ends are flat
- The size and shape of the cavity preparation will dictate which plugger is required

Varieties

- Various sizes and working ends
- Can be single-ended or double-ended

FIGURE 8.16 a, b, c**Name**

(a) Cleoid Discoid carver (b) Hollenback 3½ carver (c) Wards carver

Family

Carvers

Function and feature

- Used to carve and shape the amalgam restoration for correct anatomy and occlusion
- Edges of working ends are sharp
- Operator preference and shape of restoration will dictate which carver is required

Varieties

- Various sizes and working ends
- Can be single-ended or double-ended

(a)



(b)



(c)



(d)



(e)



Figure 8.17



Figure 8.18

FIGURE 8.17 a, b, c, d, e**Name**

(a) Ball burnisher (b) Beavertail burnisher (c) Acorn burnisher (d) T-ball burnisher (e) Egg ball/football burnisher

Family

Burnishers

Function and feature

- Polish and smooth amalgam once condensed in prepared cavity
- Adapt amalgam to the margins of restorations, reducing the chance for leakage around restorations and deficient margins
- The working end is smooth and rounded

Varieties

- Various sizes of working ends
- Can be single-ended or double-ended

False friend

Spoon excavator

FIGURE 8.18**Name**

Amalgam well

Function(s)

- Used to hold amalgam and to facilitate filling of the amalgam carrier

Varieties

- Various shapes
- Available in plastic, disposable variety



Figure 8.19



Figure 8.20

FIGURES 8.19 a, b; 8.20**Name**

(Figure 8.19 a, b) Amalgam capsule (Figure 8.20) Amalgamator

Functions and precautions

- An amalgam capsule contains amalgam material (contents will vary depending on the manufacturer)
- Care must be taken when handling amalgam to prevent inhalation of vapours, skin absorption and inhalation of air-borne particles
- Amalgamator is used to titrate amalgam prior to use
- Amalgamators must have a plastic covering over the area where the amalgam is titrated for safety in case of displacement

Varieties

- Available in different delivery systems
- Different spills (amount of amalgam contained), i.e. 1 spill, 2 spills available
- Amalgamators vary depending on manufacturer

AMALGAM WASTE MANAGEMENT**FIGURE 8.21****Name**

Amalgam Safe® container

Function

Airtight containers with foam inserts that contain non-hazardous chemicals that will suppress mercury vapours

Varieties

Other different types available depending on the manufacturer

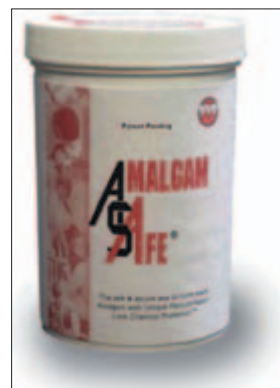


Figure 8.21



Figure 8.22



Figure 8.23



Figure 8.24

FOR COMPOSITE RESTORATIONS

FIGURE 8.22 a, b

Name

(a) Shade guide (b) Checking the shade of a patient's tooth

Functions, feature and directions for use

- Used to match the colour of the patient's natural tooth
- The tabs are coded with numbers or a combination of numbers and letters, e.g. shade A3
- The shade is then recorded on the laboratory slip chart and patient chart so the lab technician can match the colour of the prosthesis (e.g. crown or denture) or restoration to the shade of the patient's natural tooth

Varieties

Different manufacturers have different varieties of shade guides for their own products

FIGURE 8.23

Name

Composite material

Function, feature and precaution

- Available as unidose capsules or bulk tubes
- Capsules are designed for easy delivery of composite material to the cavity preparation with a composite gun
- Composite capsules are for single use
- Only sterile instruments should be used when dispensing composite from a bulk tube to prevent contamination of material

Varieties

Various brands and shades available

FIGURE 8.24

Name

Composite gun

Function and precaution

- For easy delivery of composite material
- Used in conjunction with unidose composite capsules
- Care must be taken when autoclaving (follow manufacturer's instructions)

Varieties

Various shapes available

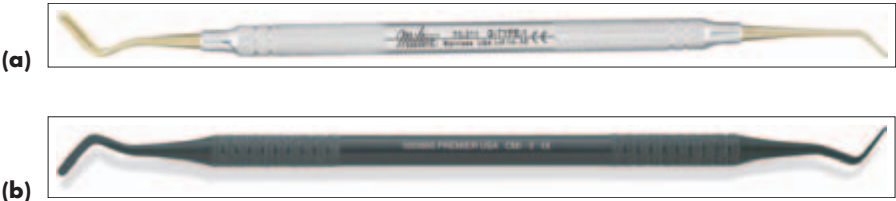


Figure 8.25

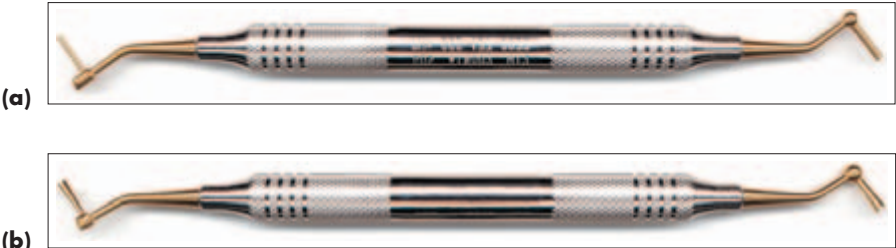


Figure 8.26

FIGURE 8.25 a, b**Name**

Composite flat plastic (a) Teflon® type (b) Anodised aluminium type. Also called: Plastic instrument

Functions

- Available as anodised aluminium or Teflon coated. These are suitable for use with composite as they do not stick to or discolour composite material
- To deliver materials to the cavity preparation
- To adapt filling materials to a cavity preparation
- To remove excess materials

Varieties

- Various sizes and shapes are available
- Can be single-ended or double-ended

False friends

Spoon excavator, Hollenback 3½ carver, Wards carver

FIGURE 8.26 a, b**Name**

Teflon-tipped super pluggers

Family

Composite pluggers/condensers

Function and features

- To pack and condense composite into a cavity preparation
- Working ends are flat, with a burnisher-type end on the angle of the shank
- Teflon-coated so they will not stick to or discolour composite material

Varieties

- Various sizes and working ends available
- Can be single-ended or double-ended



(a)



(b)



(c)

Figure 8.27



Figure 8.28



(a)



(b)

Figure 8.29

FIGURES 8.27 a, b, c; 8.28**Name**

(Figure 8.27 a, b, c) Modelling instrument (Figure 8.28) Acorn burnisher

Functions and feature

- Used to create anatomical shapes in composite material during restorations
- The modelling instrument can also be used to pack and condense composite materials
- Available in plastic autoclavable type through which the curing light can penetrate

Varieties

- Various sizes and shapes of working ends available
- Can be single-ended or double-ended

FIGURE 8.29 a, b**Name**

Contact former

Function and precaution while in use

- Used to help create a good interproximal contact between adjacent teeth
- After the initial placement of composite, the instrument is placed in the composite in the desired location. The composite is then light cured, care must be taken to place the instrument in such a way that it will not get stuck in the composite

Varieties

- Available as plastic autoclavable type through which the curing light can penetrate
- Various sizes and shapes of working ends available
- Can be single-ended or double-ended

False friends

Acorn burnisher, Acorn carver



Figure 8.30



(a)



(b)

Figure 8.31



Figure 8.32

FIGURE 8.30**Name**

Halogen curing light

Function and precautions

- Used to harden (cure) certain materials (e.g. composite, bonding agents, sealants and core build-ups)
- Materials should be built up and cured in increments of 2 mm
- Curing light can be monitored for safe and efficient operating
- Must be used with amber shield for eye protection

Varieties

Different manufacturers supply different types of halogen curing light

FIGURE 8.31 a, b**Name**

(a) LED (light-emitting diode) curing light (b) Radiometer

Functions, features and precaution

- Used to harden certain materials (e.g. composite, bonding agents, sealants and core build-ups)
- Generate light in wavelengths, may not have a fan
- Curing light can be monitored for safe and efficient operating using a radiometer
- Cures at a high density allowing a greater depth of curing
- Must be used with amber shield for eye protection

Varieties

Different manufacturers supply different types of LED curing light (the illustrated light is cordless)

FIGURE 8.32**Name**

Amber shield

Functions

- Used to protect eyes from the curing light
- The orange colour blocks the harmful light

Varieties

Available as safety glasses

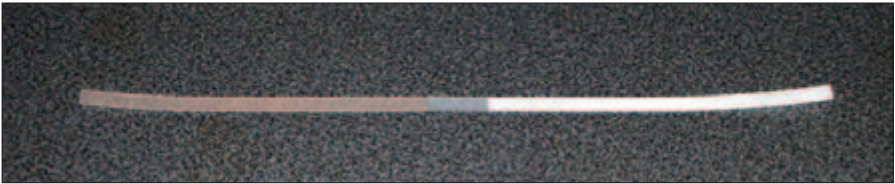


Figure 8.33

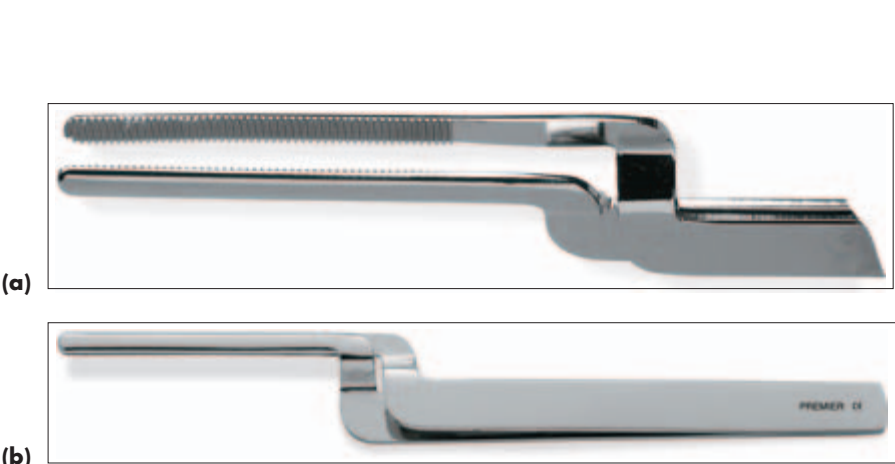


Figure 8.34

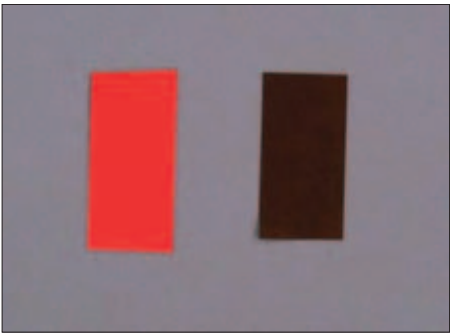


Figure 8.35

FIGURE 8.33**Name**

Composite polishing/finishing strip

Function and features

- To smooth and polish composite interproximally after final curing
- One strip has varying degrees of abrasiveness
- Single use
- Can also be used in conjunction with periodontal treatment to remove stain interproximally where there is a tight contact

Varieties

Various widths and abrasiveness available

FOR ALL RESTORATIONS AGAIN**FIGURE 8.34 a, b****Name**

(a) Miller's articulating forceps (working end) (b) Miller's articulating forceps in closed position

Function and precaution

- To secure the articulating paper in place while checking the occlusion
- The articulating paper should be 5 mm longer than the Miller forceps, if checking occlusion on posterior teeth. This is due to the patient closing down and causing discomfort by hitting off the end of the Miller's forceps, if the articulating paper is not extended

False friend

College tweezers

FIGURE 8.35**Name**

Articulating paper

Function

Carbon paper used to create a mark on a surface of a restoration or prosthesis that is interfering with the correct occlusion of the maxillary and mandibular teeth

Varieties

- Various colours and thicknesses available
- Available pre-cut or in a roll



Figure 8.36



Figure 8.37

FIGURE 8.36

Name

Straight blunt scissors

Function and feature

- Cutting
- One side of blade is blunt and one is pointed to prevent causing trauma to the patient

Varieties

Different shapes and sizes available

False friend

Surgical scissors

FIGURE 8.37

Name

Beebee crown scissors/shears

Function

Cutting and trimming various materials, e.g. rubber dam septa, provisional/temporary crowns

Varieties

Various shapes and sizes available

Set-ups

The following instruments are common to all the below listed set-ups

- Mouth mirror and handle (p. 33)
- Sickie/contra-angled probe (p. 35)
- College tweezers (p. 37)
- High and low volume/disposable saliva ejector suction tips (p. 41)
- Instruments for local anaesthetic set-up (see Section 5, p. 47)
- Instruments for rubber dam set-up (see Section 6, p. 57)
- Spoon excavator
- Enamel chisels and gingival margin trimmers
- Air turbine handpiece (p. 67)
- Conventional handpiece (p. 71)
- Various burs (see Section 7, p. 65)
- Various base and liner materials
- Flat plastic instrument
- Air/water syringe/3-in-1 syringe (p. 45)
- Wooden wedges/plastic wedges (p. 117)
- Miller forceps and articulating paper
- Dental floss

Amalgam restoration

- Amalgam carrier
- Amalgam pluggers
- Amalgam carvers
- Amalgam burnishers
- Matrix retainer and appropriate matrix material (see Section 9, p. 111)
- Amalgam well/glass dappen dish

Composite restoration

- Shade guide
- Teflon tipped flat plastic instrument
- Celluloid strip/clear transparent matrix strip (see Section 9, p. 111)
- Composite polishing/finishing strip
- Mandrel and pop-on sandpaper discs
- Light-curing unit
- Amber shield
- Composite polishing and finishing burs (see Section 7, p. 65)

Posterior composites

- Clear proximal matrices (see Section 9, p. 111)
- Light-reflecting wedges (p. 117)
- Sectional matrices and BiTine™ rings (see Section 9, p. 111)
- Contact formers

SECTION 9

MATRIX BANDS AND MATRIX RETAINERS

When a restoration involves an interproximal surface, it is not possible to achieve a properly adapted restoration without a matrix band. A matrix band creates a temporary interproximal surface, and, when appropriate, a matrix retainer secures the matrix band in place.



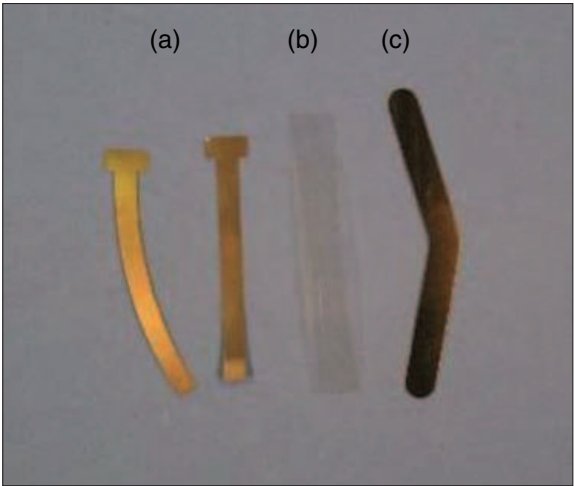


Figure 9.1



Figure 9.2

FIGURE 9.1 (a, b, c)**Name**

Matrix material

Function

Used to form a temporary wall where a proximal surface has been removed or is missing

Varieties

(a) T-band matrix (straight and curved)

- Most commonly used in paedodontics
- Single use
- Disposed of in the sharps' container

(b) Celluloid strip

- Used for anterior restorations with composite materials
- Also referred to as clear transparent matrix strip
- Single use
- Disposed of in the sharps' container
- Preformed posterior variety can be available (see Sectional matrix, Figure 9.3)

(c) Stainless steel matrix band (universal)

- Used in conjunction with amalgam restorations and a matrix retainer
- Single use
- Disposed of in the sharps' container
- Different sizes and shapes available
- Available in pre-contoured shapes

FIGURE 9.2 a, b**Name**

(a) Tofflemire matrix retainer (b) Siqveland matrix retainer

Function and features

- Used to hold a stainless steel matrix band securely
- Assembled to fit in a particular quadrant of the mouth
- Autoclavable

Varieties

Can be available in disposable plastic

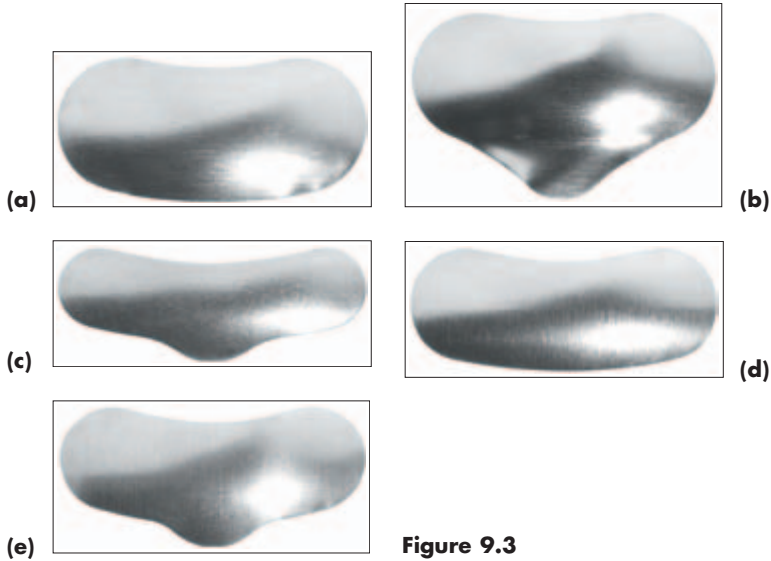


Figure 9.3



Figure 9.4



Figure 9.5

FIGURES 9.3 a, b, c, d, e; 9.4**Name**

(Figure 9.3 a, b, c, d, e) Sectional matrix and (Figure 9.4) BiTine™ ring

Function and features

- Used in conjunction with posterior restorations to temporarily replace proximal walls during Class II restorations
- Available in four sizes: paedodontic, bicuspid, smaller molars and standard molars
- The matrices are shaped to conform to tooth shape

Varieties

Many different systems available

FIGURE 9.5**Name**

Hawe Supermat Matrix®

Function and features

- Used in conjunction with posterior composite and amalgam restorations to temporarily replace proximal walls during restorations
- Available in different sizes to adapt to different sized teeth
- Available in stainless steel and clear matrix materials
- The matrices are shaped to conform to tooth shape

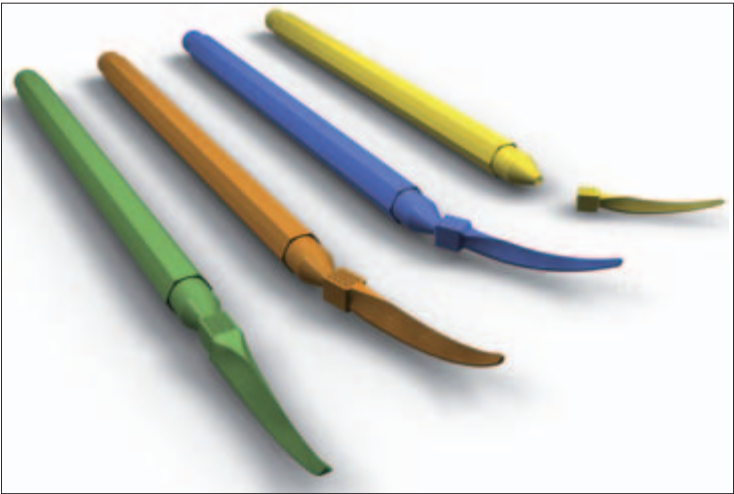
Varieties

Many other different types available from different manufacturers

(a)



(b)



(c)



Figure 9.6

FIGURE 9.6 a, b, c**Name**

(a) Wooden wedges (b) Plastic wedges

Functions and features

- Used in conjunction with a matrix band, sectional matrix or celluloid strip
- Help to support and adapt the matrix to the tooth
- Assist in maintaining adequate contact points between two adjacent teeth
- Essential for the elimination of overhangs
- Single use
- Disposed of in the sharps' container

Varieties

Various sizes, shapes and materials

FIGURE 9.7**Name**

Light-reflecting wedges

Functions and features

- Used in conjunction with a matrix band and composite restorations
- Reflect the light from the curing light onto the composite material
- Help support and adapt the matrix to the tooth
- Assist in maintaining adequate contact points between two adjacent teeth
- Essential for the elimination of overhangs
- Single use
- Disposed of in the sharps' container

Varieties

Various sizes and shapes available



Figure 9.7

TOFFLEMIRE MATRIX RETAINER AND STAINLESS STEEL MATRIX BAND SET-UP

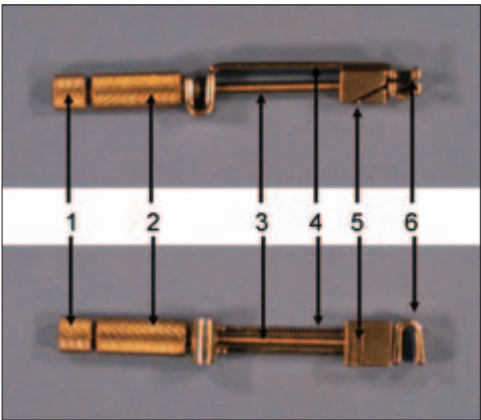


Figure 9.8



Figure 9.9

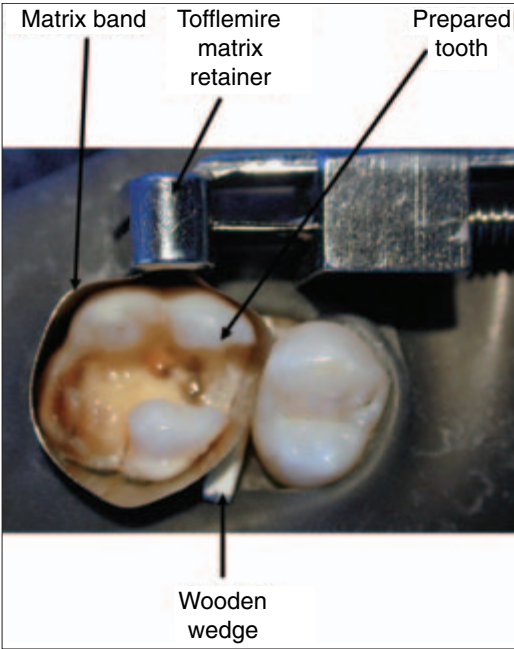


Figure 9.10

FIGURE 9.8**Parts of a Tofflemire matrix retainer**

- (1) Outer nut – Used to tighten or loosen the spindle to hold the matrix band
- (2) Inner nut – Used to change the size of the matrix band by adjusting the position to fit a specific tooth
- (3) Spindle – A straight screw used to secure the matrix band
- (4) Frame – Hold the parts of the matrix retainer together
- (5) Guide slot – Diagonal slot where the matrix band is placed and is secured by the spindle
- (6) Outer guide slots – Extensions that aid in the positioning of the matrix band in left, right or anterior/universal positions

FIGURE 9.9

Tofflemire matrix retainer with matrix band in the universal position

FIGURE 9.10

Tooth with Tofflemire retainer and matrix band in place

FIGURE 9.11 a, b**Name**

Celluloid strip in place (9.11a) Light curing an anterior restoration through a celluloid strip (9.11b)

**(a)****(b)**

Figure 9.11

SECTIONAL MATRIX AND BITINE™ RING SET-UP

MATRIX BANDS AND
MATRIX RETAINERS



Figure 9.12

FIGURE 9.12 a, b, c, d

Sectional matrix and BiTine™ ring set-up

Consists of

- Sectional matrix (9.3a)
- BiTine™ ring (9.3b)
- Special ring placement instrument

FIGURE 9.13

Tooth with sectional matrix, plastic wedges and BiTine™ rings in place



Figure 9.13

Hawe SuperMat MATRIX^R SET-UP



Figure 9.14



Figure 9.15

FIGURE 9.14

Hawe Supermat Matrix[®] set-up

Consists of

- Pre-formed matrix bands of various shapes in both stainless steel and clear matrix
- Special tool to tighten and release matrix band (9.14)

FIGURE 9.15

Hawe Supermat Matrix[®] and light reflecting wedges in place

Set-up

Set-up for using matrix retainers and matrix bands (in conjunction with a restoration set-up)

- Mouth mirror and handle (p. 33)
- Sickie/contra-angled probe (p. 35)
- College tweezers (p. 37)
- Matrix band – select the appropriate type
- Matrix retainer – if necessary
- Burnisher – to burnish the band if it has been bent (p. 95)
- Wooden, plastic or light-reflecting wedges – select proper size and shape
- Beebee crown scissors/shears (p. 109)

SECTION 10

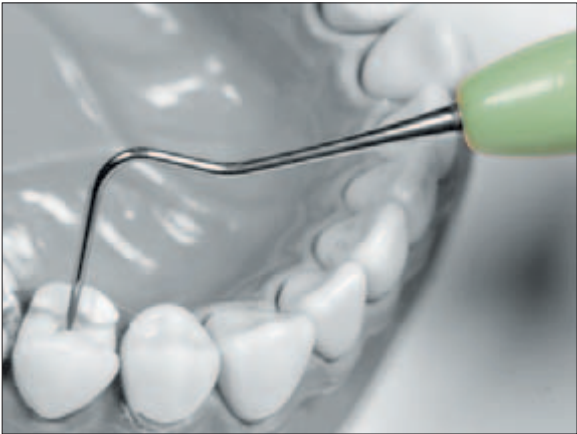
INSTRUMENTS USED IN ENDODONTIC TREATMENT

When the pulp suffers irreversible pulpitis, the only way to retain the natural tooth is by complete removal of the pulp.





(a)



(b)

Figure 10.1



Figure 10.2

ENDODONTIC INSTRUMENTS**FIGURE 10.1 a, b****Name**

DG16 probe/root canal explorer

Function

Used to probe and detect canal openings within the pulp chamber

False friends

Root canal spreader, sickle/contra-angled probe

FIGURE 10.2**Name**

Barbed broaches

Functions and precautions

- Finger instruments
- Disposed of in the sharps' container
- Used to remove the intact pulp
- 'Barbs' on the broach snag the pulp to facilitate removal
- They need to be used cautiously as they can bind and break in the canal

Varieties

Available in different sizes and widths

False friends

Endodontic K files, Hedström files (used as an alternative), finger spreaders

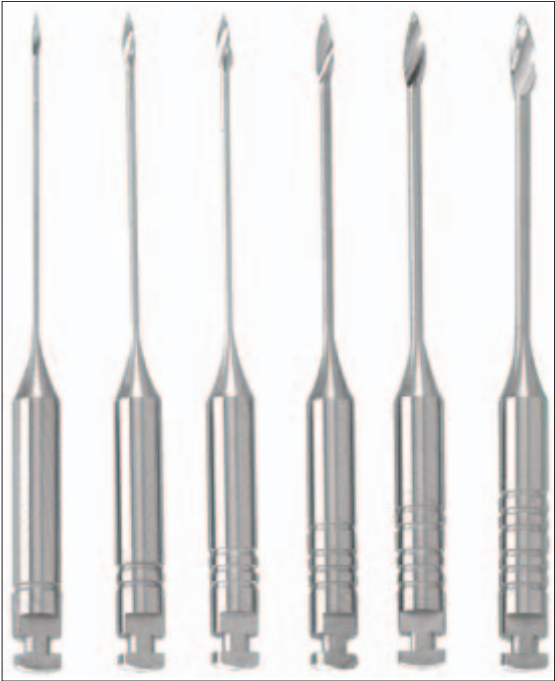


Figure 10.3



Figure 10.4

FIGURE 10.3**Name**

Gates Glidden drills

Function, features and precautions

- To enlarge the coronal third of the canal during endodontic treatment
- Small flame-shaped cutting instrument used in the conventional handpiece
- Different sizes – coded by rings or coloured bands on shank
- Are slightly flexible and will follow the canal shape but can perforate the canal if used too deeply
- Dispose of in sharps' container
- Should be used only in the straight sections of the canal

False friend

Peeso reamer drill

FIGURE 10.4**Name**

Peeso reamer drills

Function, features and precautions

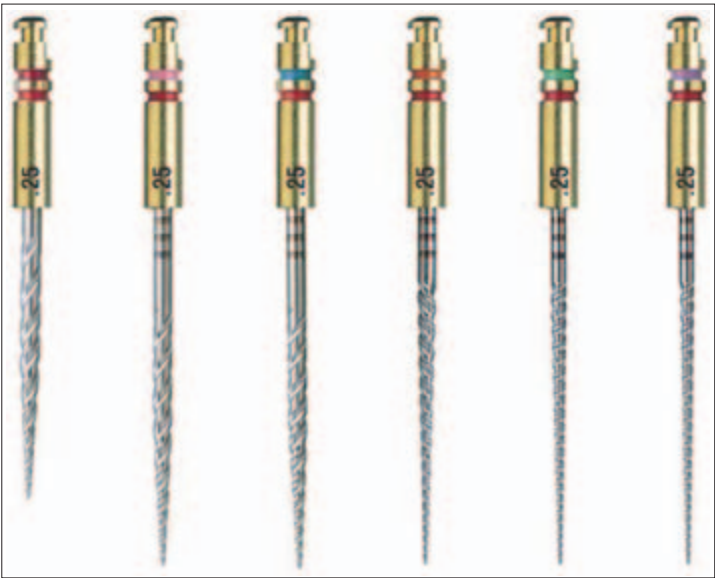
- To remove gutta percha during post preparation
- Small flame-shaped cutting instrument used in the conventional handpiece
- Different sizes – coded by rings or coloured bands on shank
- Peeso reamers are not flexible or adaptable, if not used with care can perforate canal
- Dispose of in sharps' container

False friend

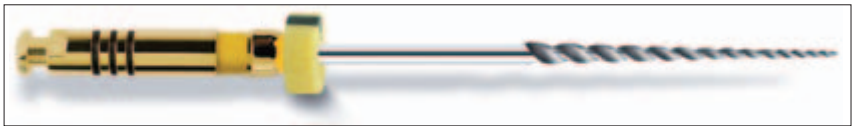
Gates Glidden drill



Figure 10.5



(a)



(b)

Figure 10.6

FIGURE 10.5**Name**

Endodontic K files. Also called: Root canal hand files

Function, features and precaution

- Finger instrument
- Colour coded by size. The 6 colours used most often are: size 15 (white); 20 (yellow); 25 (red); 30 (blue); 35 (green); 40 (black). Also available in size 6 (pink), 8 (grey) and 10 (purple)
- Operator gradually increases the size of the file to smooth, shape and enlarge canal
- The larger the number of the file, the larger the diameter of the working end
- Disposed of in the sharps' container

Varieties

- Different lengths: 21 mm, 25 mm and 30 mm
- Hedström files, Flexofiles®

False friends

Barbed broaches, finger spreaders

FIGURE 10.6 a, b**Name**

NiTi (Nickel titanium) rotary instruments

Function, features and directions for use

- Used to clean and shape the canals
- Used with endodontic handpiece and motor (see Section 7)
- NiTi is flexible and instruments follow the canal outline very well
- Several varieties of systems with different sequences of instruments are used
- Important to follow the manufacturer's recommended speeds and instructions for use

Varieties

Different lengths: 21 mm and 25 mm

False friends

Gates Glidden drills, Peeso reamer drills

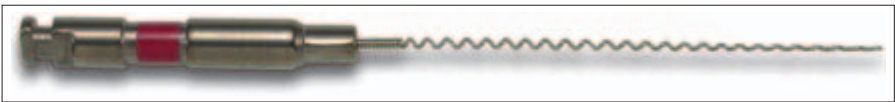


Figure 10.7

INSTRUMENTS USED IN
ENDODONTIC TREATMENT



(a)



(b)

Figure 10.8

FIGURE 10.7**Name**

Disposable irrigating syringe and disposable needle

Function, features and precaution

- Used with an irrigant to clean and disinfect the canal during endodontic treatment
- A blunt needle with side exiting delivery will reduce the risk of the needle binding within the canal
- Size of syringe and needle vary depending on operator preference
- Needle to be disposed of in the sharps' container

Varieties

Locking type – assists in prevention of splashing and needle displacement

FIGURE 10.8 a, b**Name**

Lentulo spiral filler/rotary paste filler

Function and features

- Small flexible instrument used to place materials into the canal
- Fits into the conventional handpiece
- Use with caution as it can be easily broken
- Different sizes available

Many of these finger instruments should be disposed of in the sharps' container after one use – this is *best practice*, but would not be done routinely in private surgeries.

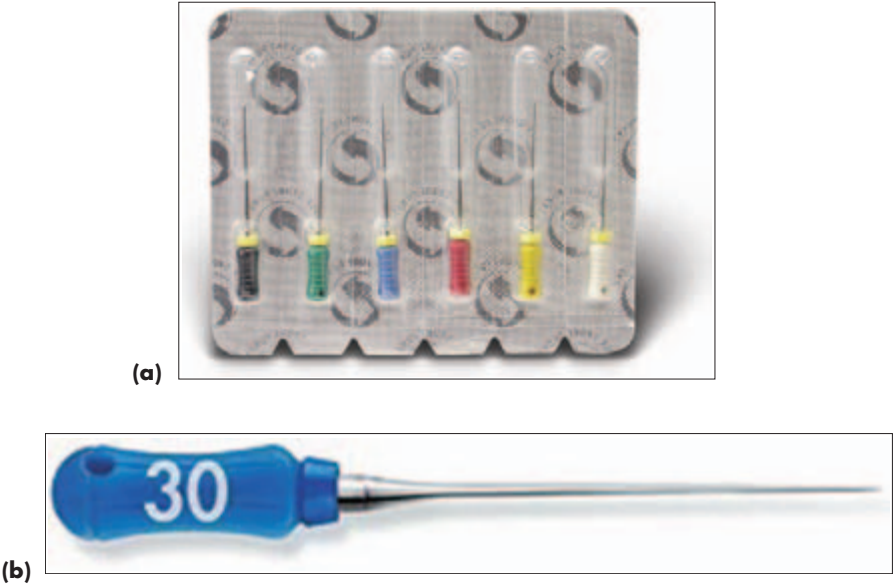


Figure 10.9



Figure 10.10

FIGURE 10.9 a, b**Name**

Finger spreader

Function, features and precaution

- Used to condense gutta percha into the canal during obturation
- Finger instrument with a smooth, pointed, tapered working end
- Disposed of in the sharps' container

Varieties

Can be of the hand instrument type (lateral condenser)

False friends

Endodontic K files, Hedström files, barbed broaches

FIGURE 10.10**Name**

Endodontic plugger

Function

Working end is flat to facilitate plugging or condensing the gutta percha after the excess has been removed by melting off with a heated instrument

Varieties

- Different sizes of working ends are available
- Available as hand or finger instruments

(a)



(b)



(c)

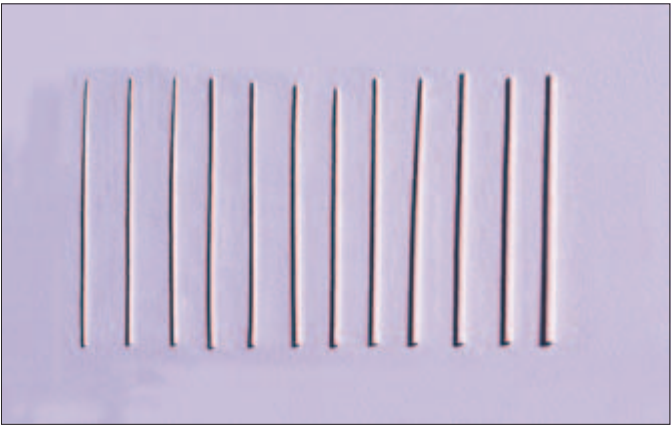


Figure 10.11

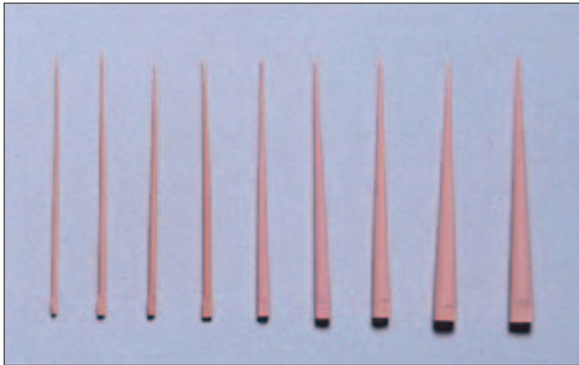


Figure 10.12

ENDODONTIC ACCESSORIES**FIGURE 10.11 a, b, c****Name**

Absorbent paper points

Functions

- To absorb any moisture in the canal (i.e. blood, pus and saliva)
- To carry medicaments into the canal

Varieties

Can be packaged in unidose (sterile) or bulk packaging (once package is open they are not sterile)

FIGURE 10.12**Name**

Gutta percha points

Function and features

- Non-soluble, non-irritant points that are condensed into the pulp chamber during obturation
- Standardised type: follows same ISO classification as endodontic files
- Non-standardised: have a greater taper than the standard ISO type

Varieties

- Can be packaged in single dose or bulk packages
- Different sizes with different tapers available

(a)



(b)



Figure 10.13

FIGURES 10.13 a, b; 10.14 a, b**Name**

(Figure 10.13a) Endodontic ring (Figure 10.13b) Endodontic block (Figure 10.14 a, b) Endodontic rulers

Functions

- An endodontic block is a sturdy block used to organise and hold endodontic finger and rotary instruments during procedures; allows easy and accurate measurement of the length of finger instruments (measuring device incorporated)
- Reduces the possibility of percutaneous injuries when handling endodontic finger and rotary instruments
- Special endodontic rulers are available for measuring the length of finger instruments

Varieties

Different varieties available

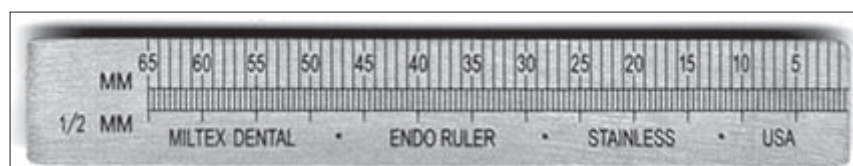
**(a)****Figure 10.14****(b)**



Figure 10.15



Figure 10.16

FIGURE 10.15**Name**

Apex locator

Functions

- An electronic instrument used to determine the distance to the apical foramen
- The screen allows the operator to visualise the file movement during instrumentation

Varieties

- Different manufacturers provide different varieties
- Available with a pulp tester incorporated in the machine

FIGURE 10.16**Name**

Electric pulp tester

Function and directions for use

- Used to test the vitality of a tooth using electric stimulus
- Electric stimulus is increased in small increments until the patient can feel the stimulus
- Toothpaste or prophylactic paste is used to conduct the current from the pulp tester to the tooth

Varieties

- Available with an apex locator incorporated in the machine
- Different manufacturers supply different varieties of pulp testers
- Can use a cold substance to test the vitality of the pulp, i.e. ethyl chloride or Endo Cold Spray

Set-ups

The following instruments are common to all the below listed set-ups

- Mouth mirror and handle (p. 33)
- Sickie/contra-angled probe (p. 35)
- College tweezers (locking type optional) (p. 37)
- High and low volume/disposable saliva ejector suction tips (p. 41)
- Instruments for local anaesthetic set-up (see Section 5, p. 47)
- Instruments for rubber dam set-up (see Section 6, p. 57)
- Sterile cotton pellets (p. 43)

- Air turbine handpiece (p. 67)
- Conventional handpiece (p. 71)
- Various burs (see Section 7, p. 65)
- Radiographs and appropriate film and holders (suitable for use with the rubber dam and clamp in position) (see Section 2, p. 15)

Root canal treatment (first appointment is the same as a pulpectomy): removal of the pulp, cleaning and disinfection of the canal and obturation (may take multiple visits).

- DG16 probe/endodontic probe
- Barbed broaches
- Gates Glidden drills
- Endodontic K files
- Ruler
- Spiral fillers
- Finger spreaders
- Irrigation syringe, needle and irrigation fluid
- Paper points
- Gutta percha and heat source
- Mortonson-Clevedent plugger (p. 93)
- Sealing material and desired filling material (temporary or permanent)

Pulpotomy: removal of the infected or exposed portion of the pulp.

- Calcium hydroxide
- Temporary filling material

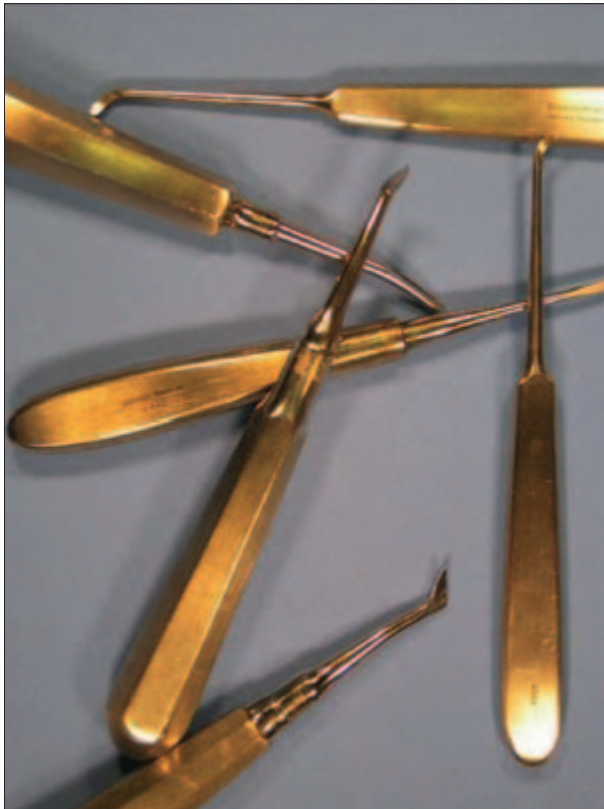
Apicectomy: may be needed when root canal treatment has failed. Involves removal of the infected apex and the surrounding infection and replacement with desired filling material.

- Sterile bib and barriers
- Surgical suction tip
- Scalpel handle and disposable scalpel blade (pp. 167, 169)
- Periosteal elevator, surgical curette
- Spoon excavator (p. 85)
- Straight handpiece and burs (see Section 7, p. 65)
- Ultrasonic unit with appropriate tip (p. 247)
- Irrigation syringe, needle, irrigant (saline) and galley pot
- Desired filling material, mixing slab, mixing gun, small pluggers and a burnisher
- Set-up for suturing (see Section 13, p. 161)

SECTION 11

ELEVATORS

Elevators are used to loosen and 'elevate' the teeth in their sockets prior to extraction. Care needs to be taken when using elevators to avoid causing trauma to the adjacent teeth.



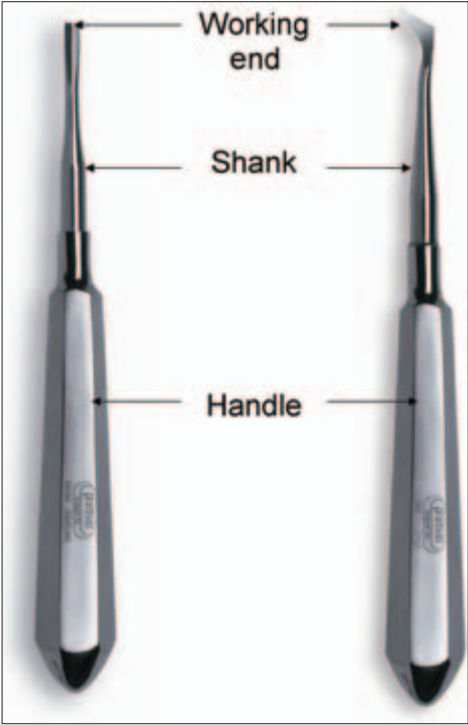


Figure 11.1

(a)



(b)



Figure 11.2

PARTS OF AN ELEVATOR

FIGURE 11.1

Working end

- The working end is the functional, elevating and retracting end of the elevator
- Single-ended
- The working end is adapted to the function of the instrument

Shank

- The area between the working end and the handle
- The shank may be straight or angled for easy access to some areas in the mouth
- The shank may also have a finger rest to enable the operator to get a better grip and apply more force

Handle

- The part of the instrument that the operator holds.
- Designed for stability and leverage
- The handle can be of many different varieties (i.e. serrated, smooth, hollow, solid, octagonal, round, large, small)
- The function dictates the type of handle

TYPES OF ELEVATOR

FIGURE 11.2 a, b

Name

(a) Warwick James elevator – straight (b) Warwick James elevators – left and right

Family

Elevators

Function and features

- Used to elevate and loosen the tooth from the periodontal ligament
- Elevation is done to create space and prevent trauma to adjacent teeth and tissues
- Available as left and right elevators, designed to adapt to the mesial and distal aspects of the tooth, respectively. Always used as a pair

False friends

Couplands chisel, Mershon band pusher

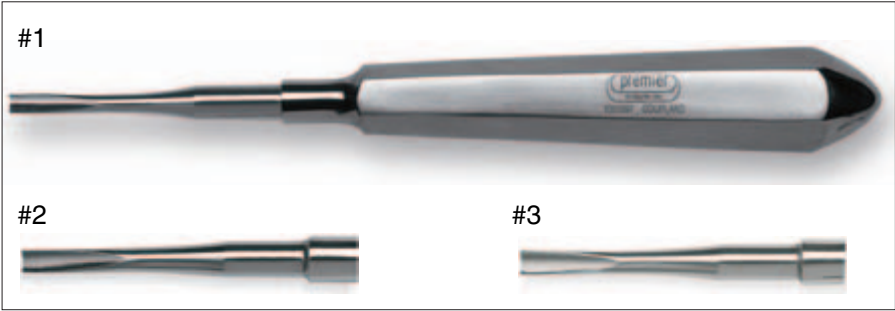


Figure 11.3

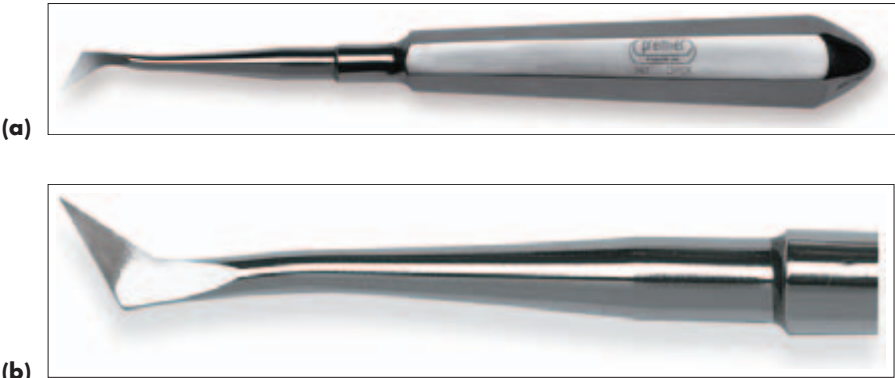


Figure 11.4

FIGURE 11.3**Name**

Couplands chisel

Family

Elevators

Function and types

- Used to elevate and loosen the tooth from the periodontal ligament
- Elevation is done to create space and prevent trauma to adjacent teeth and tissues
- Available in sizes 1, 2 and 3 – working end gets larger with increase in size number

False friends

Warwick James straight elevator, Warwick James left and right elevators, Mershon band pusher

FIGURE 11.4 a, b**Name**

Cryers elevators – left and right (Enlarged working end 11.4b)

Family

Elevators

Functions

- Used to remove interseptal bone
- Used to loosen root tips

Set-up

- Elevators are always used in conjunction with other dental instruments
- Please see set-ups in Sections 12 and 13

SECTION 12

EXTRACTION FORCEPS

Extraction forceps are used along with elevators to extract teeth. Each extraction forcep is designed for a particular area of the mouth. The beaks are designed to fit around the cervical portion of the tooth. Pointed beaks are designed to grip the furcation area.



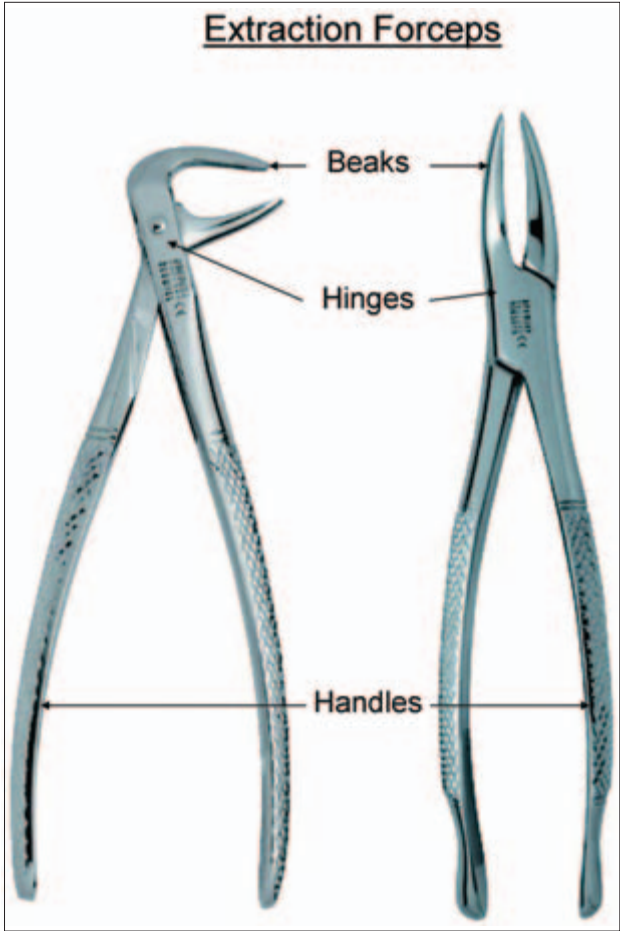


Figure 12.1



Figure 12.2

PARTS OF EXTRACTION FORCEPS

FIGURE 12.1

Beak

- The beaks of extraction forceps are designed to fit around the curve of the tooth's crown
- Universal forceps have a beak that can be used in any quadrant of the mouth
- Forceps designed for multi-rooted teeth have beaks with a point that is adapted to grip the tooth furcation
- Forceps designed for single-rooted teeth usually have smooth beaks

Hinge

- Extraction forceps have hinges (can be screw or pin type) allowing the beak and handle to be opened and grasped
- Care must be taken with hinges to prevent damage during sterilisation (see manufacturer's instructions for appropriate care)

Handle

- A serrated handle allows the operator to have a better grip
- A palm grasp is used with the handle of extraction forceps
- A curve on the end of the handle may be present for the little finger, to provide more stability and leverage
- Handles of maxillary forceps are often curved upwards, with the beak in line with the handle
- Mandibular forceps tend to have a straight handle with the beak at a 90° angle to the handle

TYPES OF EXTRACTION FORCEPS

FIGURE 12.2

Name

Bayonet extraction forceps

Family

Extraction forceps

Function

Elongated beak is designed for extraction of maxillary third molars and roots

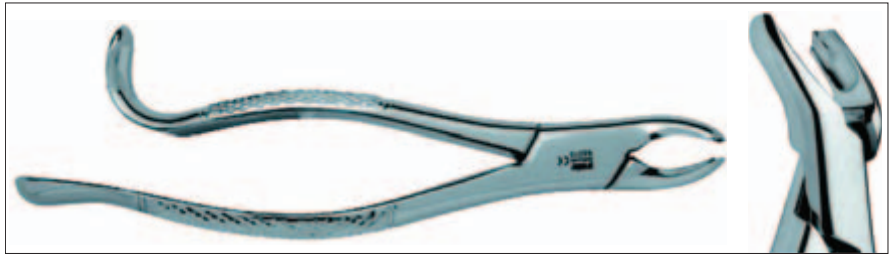


Figure 12.3

EXTRACTION FORCEPS



Figure 12.4

FIGURE 12.3**Name**

Upper right permanent molar extraction forceps

Family

Extraction forceps

Function

Used for extraction of maxillary right permanent molar teeth

Identifying features

To determine whether left or right forceps:

- Hold forceps in hand loosely (beak facing patient)
- The point of the beak should grip the furcation on the buccal side ('beak to cheek')

False friend

Upper left permanent molar extraction forceps

FIGURE 12.4**Name**

Upper left permanent molar extraction forceps

Family

Extraction forceps

Function

Used for extraction of maxillary left permanent molar teeth

Identifying features

To determine whether left or right forceps:

- Hold forceps in hand loosely (beak facing patient)
- The point of the beak should grip the furcation on the buccal side ('beak to cheek')

False friend

Upper right permanent molar extraction forceps



Figure 12.5



Figure 12.6



Figure 12.7

FIGURE 12.5**Name**

Upper root extraction forceps

Family

Extraction forceps

Function

The extended beak is designed for extraction of maxillary roots

FIGURE 12.6**Name**

Upper premolar extraction forceps

Family

Extraction forceps

Function

Used for extraction of maxillary permanent canines, premolars and anterior deciduous teeth

False friend

Upper permanent straight extraction forceps

FIGURE 12.7**Name**

Upper straight extraction forceps/upper permanent incisor extraction forceps. Also called: upper permanent anterior extraction forceps

Family

Extraction forceps

Function

Used for extraction of maxillary anterior permanent teeth. Smaller version available for extraction of maxillary deciduous canines



Figure 12.8



Figure 12.9



Figure 12.10

FIGURE 12.8**Name**

Lower premolar extraction forceps

Family

Extraction forceps

Function

- Used for extraction of mandibular permanent anterior and premolar teeth
- Can be used on mandibular right or left side

False friends

Lower root forceps

FIGURE 12.9**Name**

Lower permanent molar extraction forceps

Family

Extraction forceps

Function and feature

- Used for extraction of mandibular permanent teeth
- Point of the beak fits in the furcation of the molars
- Can be used on mandibular right or left side

False friend

Lower deciduous molar extraction forceps

FIGURE 12.10**Name**

Lower root extraction forceps

Family

Extraction forceps

Function

- Used for extraction of permanent mandibular roots
- Can be used on mandibular right or left side

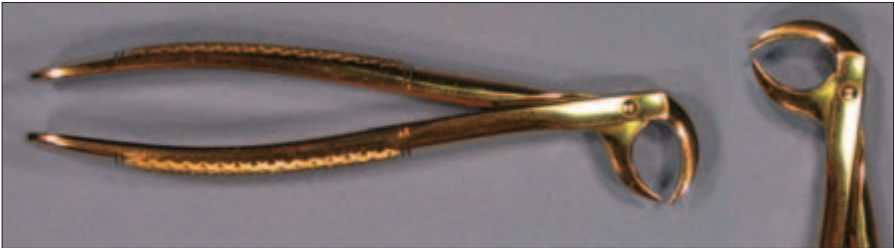


Figure 12.11



Figure 12.12



Figure 12.13

FIGURE 12.11**Name**

Cowhorn extraction forceps

Family

Extraction forceps

Function and features

- Used for extraction of mandibular permanent molars
- Point of the beak is designed to grip the furcation of the molars
- Can be used on the mandibular right or left side

FIGURE 12.12**Name**

Lower deciduous anterior extraction forceps

Family

Extraction forceps

Functions

- Used for extraction of mandibular deciduous anterior teeth
- Can be used on mandibular right or left side

FIGURE 12.13**Name**

Lower deciduous molar extraction forceps

Family

Extraction forceps

Functions

- Used for extraction of deciduous mandibular molar teeth
- Can be used to extract small permanent third molars
- Can be used on mandibular right or left side

Set-ups

The following instruments are common to all the below listed set-ups

- Mouth mirror and handle (p. 33)
- Sickie/contra-angled probe (p. 35)
- College tweezers (p. 37)
- Instruments for local anaesthetic set-up (see Section 5, p. 47)

Routine extractions:

- High and low volume/disposable saliva ejector suction tips (p. 41)
- Periosteal elevator (p. 167)
- Couplands chisel (p. 147)
- Operator's choice of forceps and elevators

Surgical extractions:

- Sterile bib and barriers
- Surgical suction (p. 173)
- McKesson mouth prop (p. 163)
- Scalpel handle and disposable scalpel blade (pp. 167, 169)
- Periosteal elevator (p. 167)
- Bowdler Henry rake, Kilner or Austin retractor (p. 165)
- Irrigation syringe, disposable needle and irrigant (p. 179)
- Galley pot (p. 181)
- Straight handpiece (p. 69)
- Various burs (see Section 7, p. 65)
- Couplands chisel (p. 147)
- Warwick James left and right elevators (p. 145)
- Warwick James straight elevator (p. 145)
- Surgical curette (p. 169)
- Bone file (p. 173)
- Operator's choice of extraction forceps
- Suturing set-up (see Section 13, p. 161)
- Sterile gauze, bib and barriers
- Post-operative instruction sheet

SECTION 13

SURGICAL INSTRUMENTS

Many procedures may involve an invasive surgical approach, requiring special dental instruments. Due to the specialised nature of this area, some of these instruments may not be used in the general dental surgery, and some of these procedures may be carried out in conjunction with various sedation techniques. It is important that during these procedures the dental team tries to maintain the most sterile field possible.





Figure 13.1



Figure 13.2



Figure 13.3

GENERAL SURGICAL INSTRUMENTS**FIGURE 13.1****Name**

Towel clip

Function

Used to secure bibs and towels in place

Varieties

Various sizes and shapes available

FIGURE 13.2**Name**

McKesson mouth prop

Function and feature

- Used to prop open mouth
- Attached to a parachute chain for retrieval in case of displacement (made of rubber to protect teeth)

Varieties

- Various colours and shapes available
- Available in small, medium and large sizes, or sizes 1, 2 and 3

FIGURE 13.3**Name**

Mouth spreader/gag

Functions

- Used to prop open mouth
- A locking mechanism on handle props open the mouth
- Can be used during sedation procedures

Varieties

Various sizes and shapes available



Figure 13.4



Figure 13.5

FIGURE 13.4**Name**

Kilner cheek retractor

Functions

- Retraction of cheek
- Aids in visibility
- Protection of tissues

FIGURE 13.5**Name**

Austin retractor

Functions

- Aids in visibility
- Protection of tissues
- Retraction of cheek and tongue

FIGURE 13.6**Name**

Bowdler Henry rake retractor

Functions

- Retraction of periodontal flap during surgical procedures
- Aids in visibility
- Protection of tissues



Figure 13.6



Figure 13.7

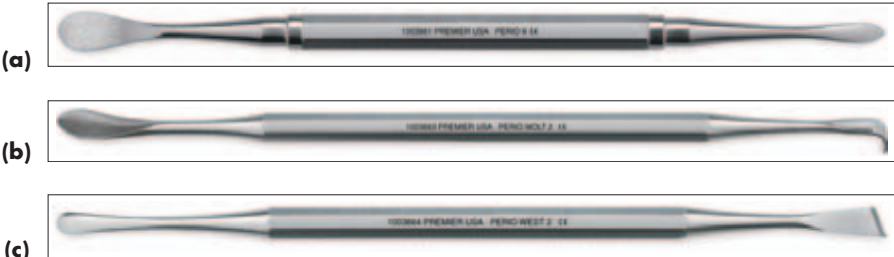
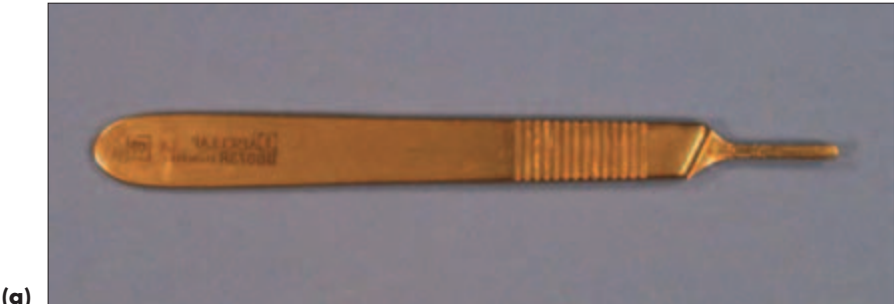


Figure 13.8



(a)



(b)

Figure 13.9

FIGURE 13.7**Name**

Minnesota retractor

Functions

- Aids in visibility
- Protection of tissues
- Retraction of the cheek and tongue

Varieties

Different varieties of retractors available

FIGURE 13.8 a, b, c**Name**

Howarths periosteal elevator

Family

Elevators

Functions and features

- Retraction
- To separate the tissue from the bone
- One working end is a pointed tip and the other is rounded with sharp edges

Varieties

Different lengths and shapes of working ends available

False friend

Bone file

FIGURE 13.9 a, b**Name**

(a) Stainless steel scalpel handle (b) Disposable scalpel handle and scalpel blade

Functions and features

- Scalpel handle holds disposable scalpel blade securely
- Surgical blade used to make incisions intra-orally
- Stainless steel scalpel handle – autoclavable

Varieties

- Can have a plastic scalpel handle – disposable
- Various sizes and shapes of scalpel blades available



Figure 13.10



Figure 13.11



Figure 13.12

FIGURE 13.10**Name**

Disposable scalpel blade

Function and features

- Scalpel blades are used to make incisions
- Made of surgical carbon steel
- Different shapes for different procedures (e.g. # 11 blade, # 15 blade)
- Single use
- Disposed of in the sharps' container
- Supplied in a sterile package

Varieties

Available in different shapes, sizes and lengths depending on procedure

FIGURE 13.11**Name**

Mitchell trimmer

Functions

- To aid in raising the mucoperiosteal flap for access
- To aid in removing pathology

False friend

Wards carver

FIGURE 13.12**Name**

Spoon curette/surgical curette

Function

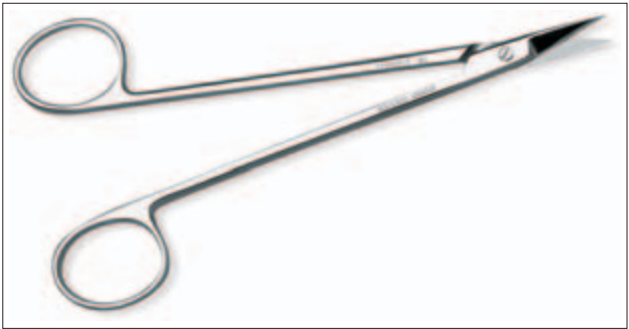
Used in the socket of an extracted tooth to remove debris and infectious material

Variations

Shank can be straight, curved or shaped like a spoon, with different sizes of working ends

False friend

Spoon excavator



(a)



(b)

Figure 13.13



(a)



(b)

Figure 13.14

FIGURE 13.13 a, b**Name**

Curved surgical scissors (13.13a)

Straight surgical scissors (13.13b)

Function

Sharp pointed scissors are used for cutting soft tissues in surgical procedures

Variations

- Different lengths and sizes available
- Working ends can be curved or straight

False friends

Suture scissors, blunt scissors

FIGURE 13.14 a, b**Name**

(a) Bone rongeurs (b) Bone nibblers

Function and features

- Used to trim sharp edges of bone remaining after extractions
- Usually used during multiple extractions
- Have a spring mechanism between the handles
- Have a sharpened working end
- Can be end-cutting or side-cutting
- Can be used in any quadrant in the mouth

False friend

Extraction forceps

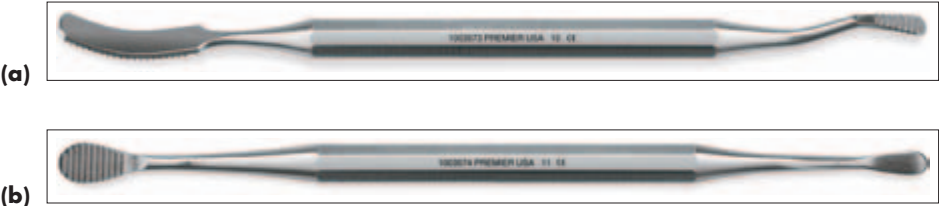


Figure 13.15

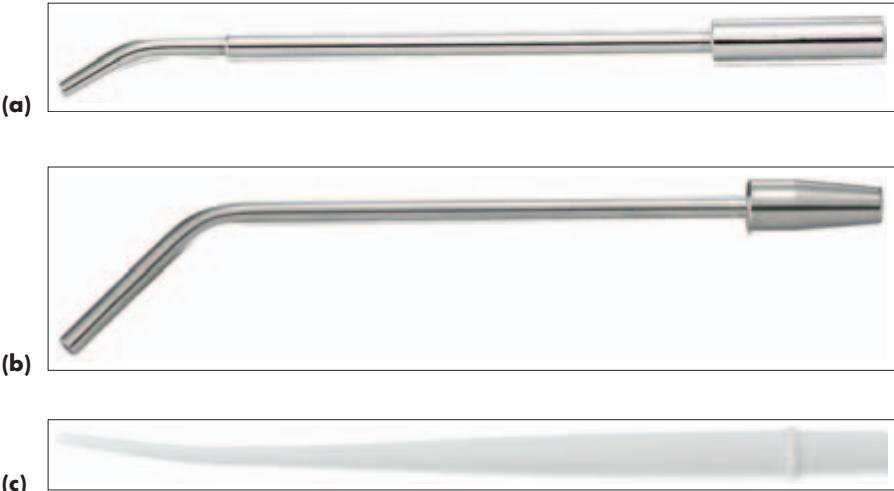


Figure 13.16

FIGURE 13.15 a, b**Name**

Bone file

Function and direction for use

- Used to remove and smooth sharp pieces of alveolar bone remaining after extraction
- Used with a push–pull action

False friend

Periosteal elevator

FIGURE 13.16 a, b, c**Name**

Metal autoclavable surgical suction tips (13.16a, b) Plastic disposable surgical suction tip (13.16c)

Function

For suction in surgical procedures

Varieties

- Different sizes and shapes available
- Can be made of metal, plastic or sterile disposable plastic

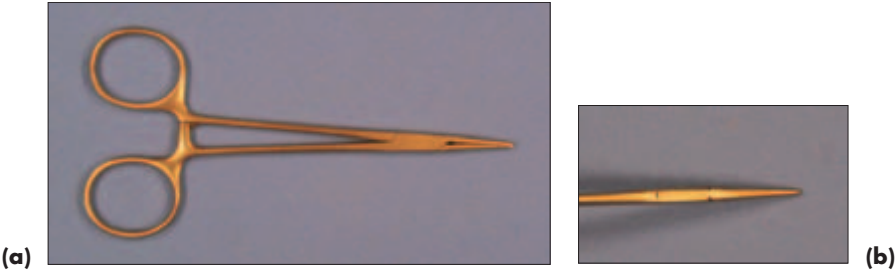


Figure 13.17

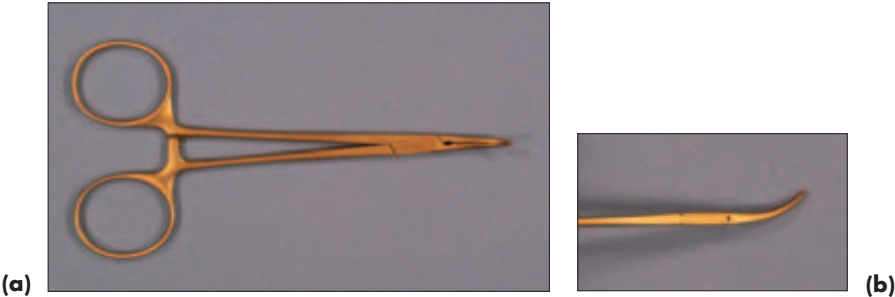


Figure 13.18

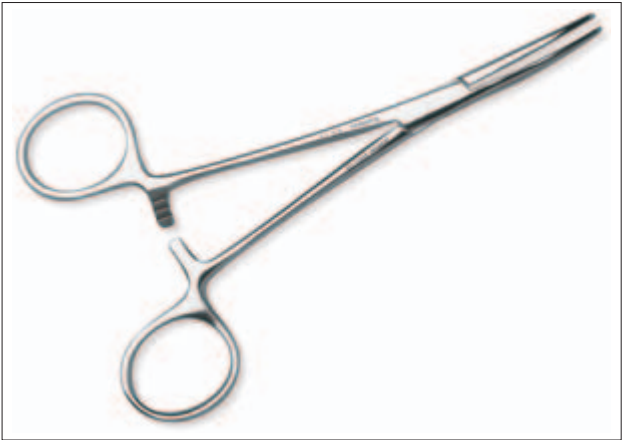


Figure 13.19

FIGURES 13.17 a, b; 13.18 a, b; 13.19**Name**

(Figure 13.17 a, b) Mosquito artery forceps – straight (Figure 13.18 a, b) Mosquito artery forceps – curved (Figure 13.19) Haemostat

Functions and features

- Used for grasping objects and holding them securely
- Can be used to apply pressure to a severed artery
- Handle has a locking mechanism

Varieties

- Many different sizes available
- Working end angle can vary

False friends

Beebe crown scissors, needle holders

FIGURE 13.20 a, b**Name**

(a) Mayo needle holder (b) Castroviejo needle holder

Function and feature

- Used along with tissue dissecting forceps during suturing
- Locking mechanism on the handle holds suture securely while suturing
- Scissor-like surgical instrument with serrated edges for better grip

Varieties

Many different shapes and sizes available

False friends

Mosquito artery forceps, suture scissors, surgical scissors, haemostats

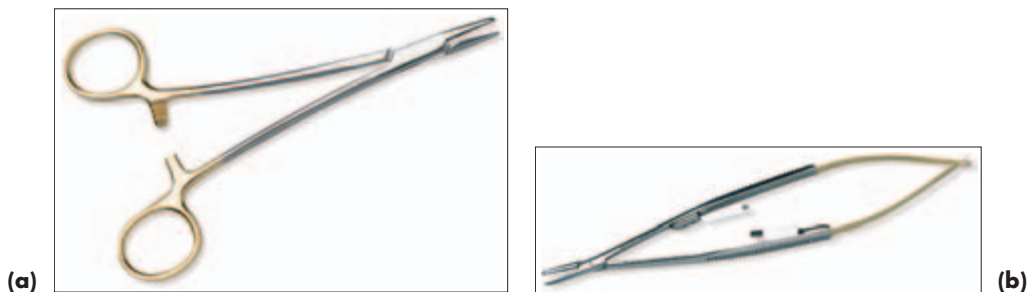


Figure 13.20

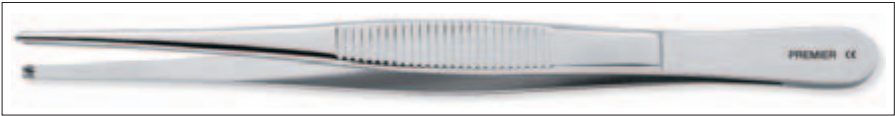
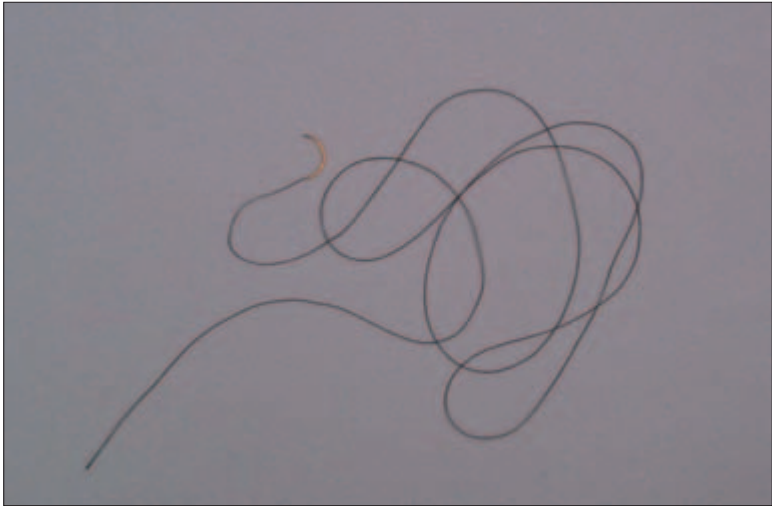


Figure 13.21

(a)



(b)



Figure 13.22

FIGURE 13.21**Name**

Toothed dissecting forceps/Tissue dissecting forceps

Functions and feature

- Used to retract tissues, 'teeth' on working end aid in grasping tissue
- Facilitate suturing

False friend

College tweezers

FIGURE 13.22 a, b**Name**

Suture needle and silk suture

Function and features

- Aid in healing by closing tissue after surgery
- Pre-threaded disposable suture needles
- Supplied sterile in a package
- Suture needles are curved with a sharp edge

Varieties

- Many different sizes available
- Can be made of different materials (e.g. silk, absorbable materials)

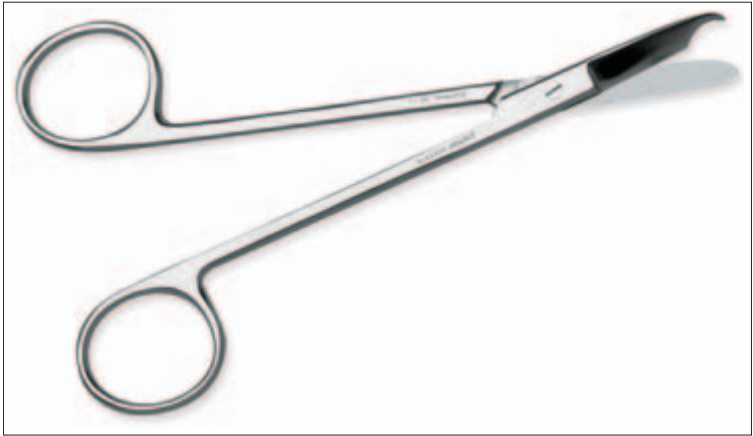


Figure 13.23



(a)



(b)

Figure 13.24

FIGURE 13.23**Name**

Suture scissors

Function and features

- Scissors designed for suture removal
- Blades – one has a curved edge and one has a notched edge
- During suture removal, suture is scooped up by blade with the notched end before cutting to prevent tissue trauma

False friends

Surgical scissors, needle holders

FIGURE 13.24 a, b**Name**

(a) Disposable irrigating syringe and disposable needle (b) Assembled disposable irrigation syringe and disposable needle

Function and precaution

- Used in conjunction with saline solution to provide water spray when using hand-piece during a surgical procedure
- Used to irrigate and rinse treatment area
- Should be used with a blunt needle to prevent injury

Varieties

- Locking type – prevents splashing and needle displacement
- Size of syringe and needle vary depending on operator preference

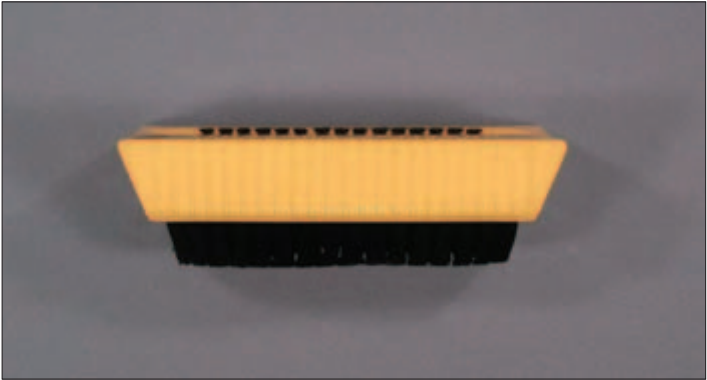


Figure 13.25



Figure 13.26

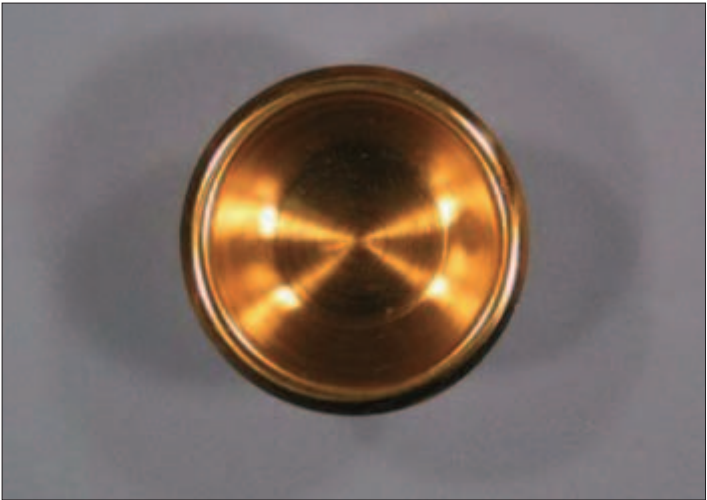


Figure 13.27

FIGURE 13.25**Name**

Nail brush

Function and precaution

- Used to clean under fingernails during a surgical scrub
- Surgical scrub technique should be followed according to the local infection control policy

Varieties

Different sizes and shapes available

FIGURE 13.26**Name**

Kidney dish

Functions

- Used to hold instruments when preparing for a surgical procedure
- Used to hold liquids or materials
- Used if patient gets ill

Varieties

- Many different sizes and shapes
- Available in disposable or metal types

FIGURE 13.27**Name**

Galley pot

Function

Used to hold saline for irrigation

Varieties

Various sizes available



Figure 13.28



Figure 13.29



Figure 13.30

INSTRUMENTS FOR PERIODONTAL SURGERY**FIGURE 13.28****Name**

Blake's gingivectomy knife handle

Function and features

- A handle designed specifically to grasp a disposable scalpel blade for cutting gingival tissue
- Allen key provided to secure blade to handle

Varieties

Can be used with different sizes and shapes of blades

FIGURE 13.29**Name**

Messing gun

Function and description

- Modified and specialised amalgam carrier
- Used in retrograde filling procedure (of a root apex)
- Used during apicectomy

False friend

Amalgam carrier

FIGURE 13.30 a, b, c**Name**

Gingivectomy knives (a) Kirkland (b) Orban Goldman-Fox (c) Buck

Function

Used to contour and incise gingival tissue during periodontal surgery

Varieties

Various sizes available



Figure 13.31

SURGICAL INSTRUMENTS



Figure 13.32

FIGURE 13.31**Name**

Ochsenbein chisel

Function, features and direction for use

- Used to remove and smooth areas of the bone during surgical procedures
- Working end is a flat bevelled cutting blade
- Used with a small broad push stroke

Varieties

Various sizes available

IMPLANTS**FIGURE 13.32****Name**

Implant kit

Function and features

- Specialised drills used in conjunction with implant procedures
- Drills are colour coded for easy identification
- Requires a special conventional handpiece

Varieties

Many different types of drills and kits available



Figure 13.33

SURGICAL INSTRUMENTS



Figure 13.34

EMERGENCY EQUIPMENT

- !** *The following are emergency equipment items on the spotter list of the National Examining Board for Dental Nurses. This is not meant to be an exhaustive list of emergency equipment that may be needed. These are included in this section due to the nature of surgical procedures.*

FIGURE 13.33

Name

Oro-pharyngeal airway/Guedel airway

Function and precautions

- Used in an emergency situation to maintain the patient's airway
- Should be kept in emergency kit
- Must be on premises when conscious sedation is being performed

Varieties

Various sizes available

FIGURE 13.34

Name

Pocket mask

Function and features

- Used in an emergency situation to provide artificial respiration
- Is fitted with a one-way valve that does not allow fluids to flow between the rescuer and the victim
- Can be used with an oxygen source

Set-ups

The following instruments are common to all the below listed set-ups

- Mouth mirror and handle (p. 33)
- Sickle/contra-angled probe (p. 35)
- Sterile surgical suction (p. 173)
- Instruments for local anaesthetic set-up (see Section 5, p. 47)

Surgical procedure set-up:

- Towel clips
- McKesson mouth props (small, medium or large)
- Sterile gauze, barrier and wrapping
- Sterile surgical gloves
- Kilner cheek retractor, Bowdler Henry rake retractor and Austin retractor
- Scalpel handle and disposable scalpel blade
- Periosteal elevator
- Couplands chisel (standard size 3)
- Warwick James elevators: left, right and straight
- Mitchell trimmer and spoon curette
- Mosquito artery forceps: straight and curved
- Surgical scissors
- Galley pot and kidney dish
- Disposable irrigation syringe and disposable needle
- Straight handpiece and surgical burs
- Bone rongeurs, cutters and nibblers
- Bone file
- Selected sterile sutures
- Toothed dissecting forceps/tissue dissecting forceps
- Mayo needle holder
- Suture scissors
- Post-operative instructions' sheet

Separates

- Extraction forceps (see Section 12, p. 149)

Set-up for suturing

- Pre-threaded sterile suture pack (size and type indicated by operator and procedure)
- Choice of needle holder
- Suture scissors
- Sterile gauze squares
- Toothed dissecting forceps/tissue dissecting forceps

SECTION 14

MEASURING DEVICES

There are many times when instruments are needed for measurement. Some examples of what we may need to measure are: length of root canals, width of lesions and the thickness of crowns.





Figure 14.1



Figure 14.2

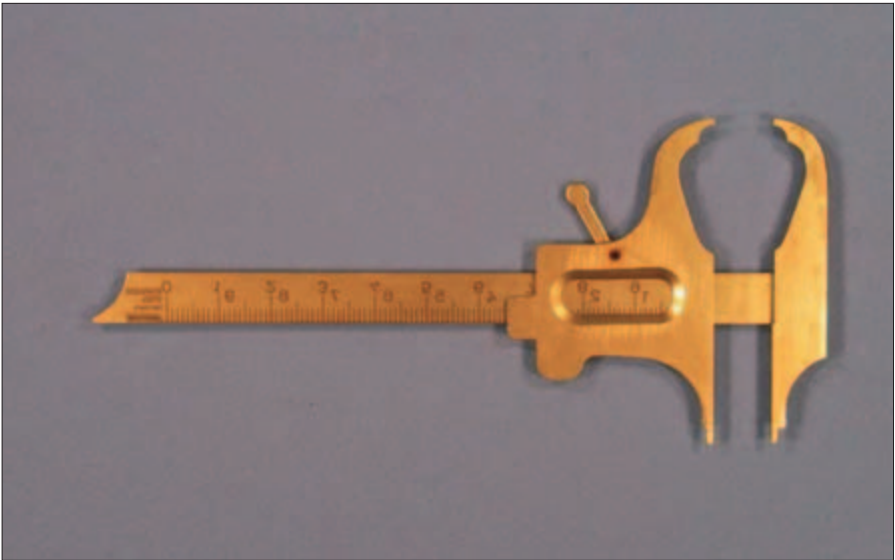


Figure 14.3

FIGURE 14.1**Name**

Figure-of-eight calipers

Function and features

- Used for measuring thickness of porcelain and metal
- Calibrated in millimetres and 1/10 millimetres

FIGURE 14.2**Name**

Iwanson gauge

Function and features

- Used for measuring thickness of porcelain and metal
- Calibrated in millimetres and 1/10 millimetres

FIGURE 14.3**Name**

Boley gauge

Function and features

- Used in the clinic and in the laboratory
- Calibrated in millimetres and 1/10 millimetres

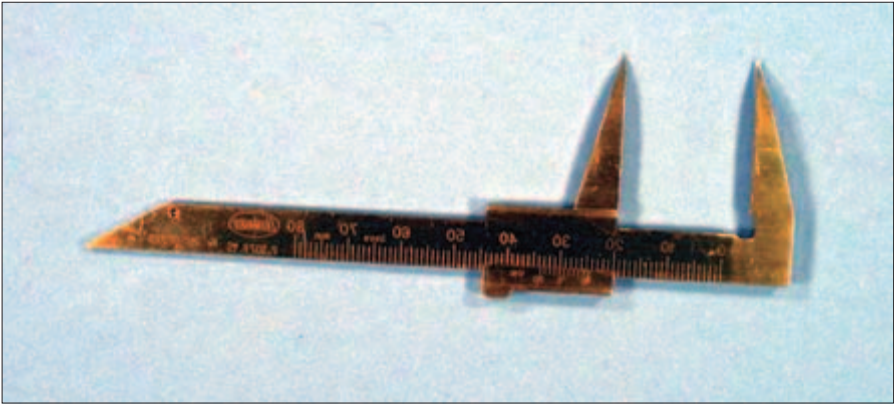


Figure 14.4



Figure 14.5

FIGURE 14.4**Name**

Vernier gauge

Function

Used for measuring in many disciplines of dentistry

FIGURE 14.5**Name**

Dividers

Function

Used for measuring in many disciplines of dentistry

SECTION 15

IMPRESSION TRAYS

Impression trays are used in conjunction with various types of materials to take imprints of the patient's dentition. The type of tray chosen depends on the type of impression needed and the procedure that is indicated.



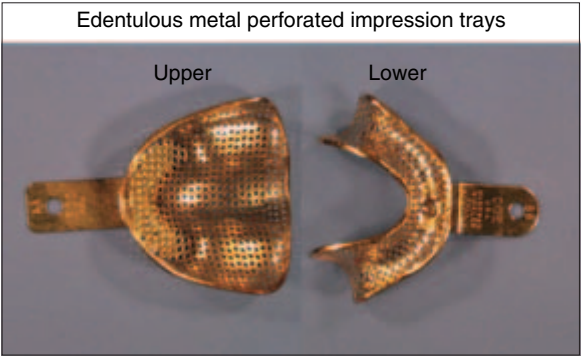


Figure 15.1

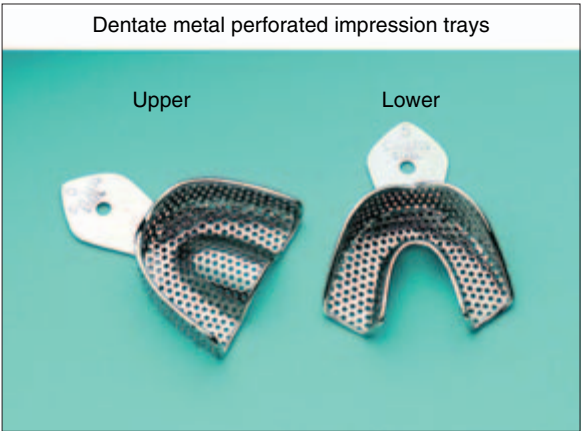


Figure 15.2

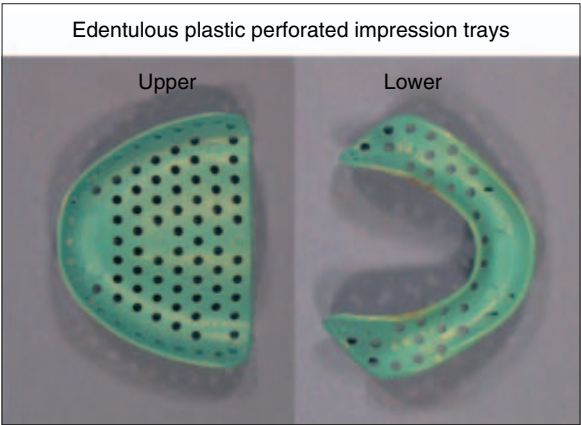


Figure 15.3

FUNCTIONS AND FEATURES OF IMPRESSION TRAYS

- Used to hold impression material
- Can be perforated for better retention
- Have a handle for better grasp during placement and removal
- Dentate impression trays – for patients with teeth
- Edentulous impression trays – for patients with no teeth

TYPES OF IMPRESSION TRAYS

FIGURES 15.1; 15.2

Name

Metal perforated type trays

Features

- Autoclavable
- Available in different sizes (denoted by numbers)
- Not easily adapted
- Available as solid metal trays

FIGURES 15.3; 15.4

Name

Plastic type/stock tray

Features

- Disposable, single use
- A tray adhesive may be used for added retention of impression material
- Available in different sizes (denoted by colours)
- Can be adapted using a heat source



Figure 15.4



Figure 15.5



Figure 15.6

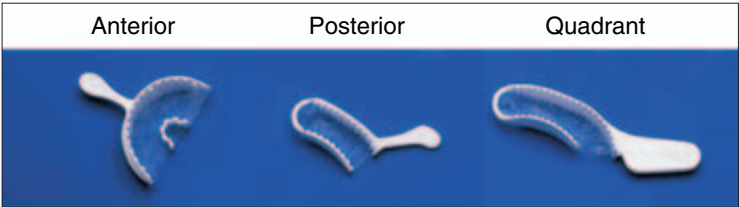


Figure 15.7

FIGURE 15.5**Name**

Universal sectional impression tray

Function and features

- Modified tray used to take an impression of a specific area of the mouth
- May be perforated for retention
- Fabricated from flexible metal – adaptable
- Only suitable for dentate patients
- Autoclavable

FIGURE 15.6**Name**

Custom tray/special tray

Features

- Fabricated from a plaster model of the patient's dentate or edentulous arches
- Fabricated from an acrylic material
- Disposable, single use
- Must be 'painted' with tray adhesive for retention of impression material

FIGURE 15.7**Name**

Triple tray™

Function and features

- Used to take an impression of both arches simultaneously
- Fabricated from a combination of plastic and flexible webbing material
- Many different sizes available (anterior, posterior, quadrant)
- Disposable, single use
- Must be painted with tray adhesive for retention of impression material

Set-up

Set-up for taking an impression. Set-up will vary depending on the type of impression being taken.

- Desired impression material
- Desired type of impression tray, tray adhesive and applicator brush
- If required, mixing spatula, mixing bowl and water measure
- Kidney dish – in case of gag reflex when taking impressions (p. 181)
- Tissues and rinse cup for patients
- Wax may be required if the tray needs to be extended
- Laboratory prescription form and laboratory bag
- Red ribbon wax (p. 255)
- Equipment/materials for disinfection of impression prior to sending to the laboratory

SECTION 16

ORTHODONTIC INSTRUMENTS

Orthodontics is the study of the diagnosis, prevention and treatment of irregularities of the teeth and jaws. Orthodontic instruments are used in conjunction with fixed and removable appliances.



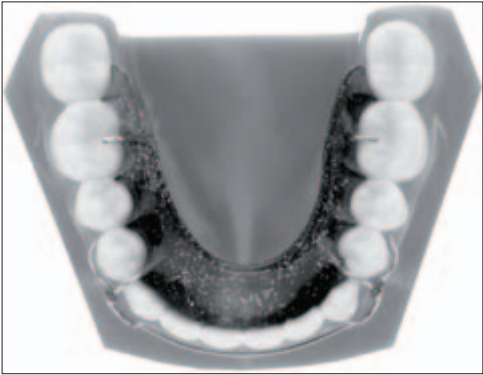


Figure 16.1



(a)



(b)



(c)

Figure 16.2

ORTHODONTIC APPLIANCES**FIGURE 16.1****Name**

Removable orthodontic appliance (Hawley retainer)

Features

- Is removable and depends on patient compliance for success
- Constructed from acrylic and a combination of stainless steel retentive clasps and springs
- The acrylic of a removable appliance can be adjusted by grinding with a straight handpiece and acrylic bur, and the clasps and spring can be adjusted with a variety of orthodontic pliers

Varieties

There are many types of removable appliances depending on the needs of the patient (e.g. expansion appliances, Hawley retainers)

FIGURE 16.2 a, b, c**Name**

Fixed orthodontic appliances (a) rapid palatal expander (b) metal fixed appliance (c) ceramic fixed appliance

Features

- Are cemented to the teeth and cannot be removed by the patient
- Consist of a combination of orthodontic bands, orthodontic brackets or orthodontic wires
- Require special orthodontic pliers for adjustments

Varieties

There are many types of fixed appliances depending on the needs of the patient (e.g. braces, palatal expanders)



Figure 16.3

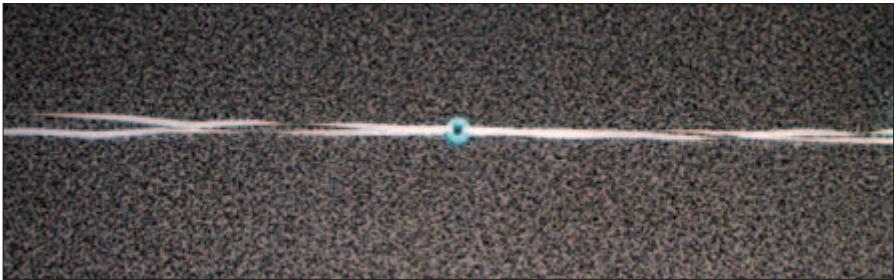


Figure 16.4

FIGURE 16.3**Name**

Headgear and face bow

Function and features

- Has an inner bow (fits into the buccal tubes of the fixed appliance) soldered to an outer bow (can be attached to a strap)
- The headgear is worn outside the mouth, and the face bow is attached to the buccal tubes intra-orally
- The orthodontic headgear is used to prevent establishment of deep overbites by restricting the growth of the maxillary arch. Can also be used to prevent mesial drifting of maxillary molars when teeth have been extracted anterior to the molars
- The strap has a safety mechanism which prevents the bow from springing back at the patient if it is pulled forwards

Varieties

Different sizes available colour coded

ORTHODONTIC MATERIALS**FIGURE 16.4****Name**

Elastic separators

Function and placement

- Used to create interproximal space to allow orthodontic bands to be placed
- Separators can be placed with floss or separator placing pliers (see Figure 6.11)



Figure 16.5



(a)



(b)

Figure 16.6

FIGURE 16.5**Name**

Orthodontic band

Function, features and placement

- Used to secure auxiliary devices to aid in tooth positioning
- Stainless steel bands are cemented on posterior teeth
- Pre-formed – variety of sizes available
- Occlusal edge is slightly rounded, whereas gingival edge is straight
- Placement is preceded by placement of separators to create interproximal space

Varieties

Available in different shapes and sizes

FIGURE 16.6 a, b**Name**

(a) Metal orthodontic bracket (b) Ceramic orthodontic bracket

Function and features

- Used to secure an orthodontic archwire in place
- Most often bonded to the buccal surface of the tooth
- Orthodontic brackets may have coloured indicators to help orientate placement
- Orthodontic brackets often have a textured back that aids in bonding to the tooth

Varieties

- Many different brands and sizes available
- Can be made from different materials (e.g. stainless steel, ceramics)



Figure 16.7

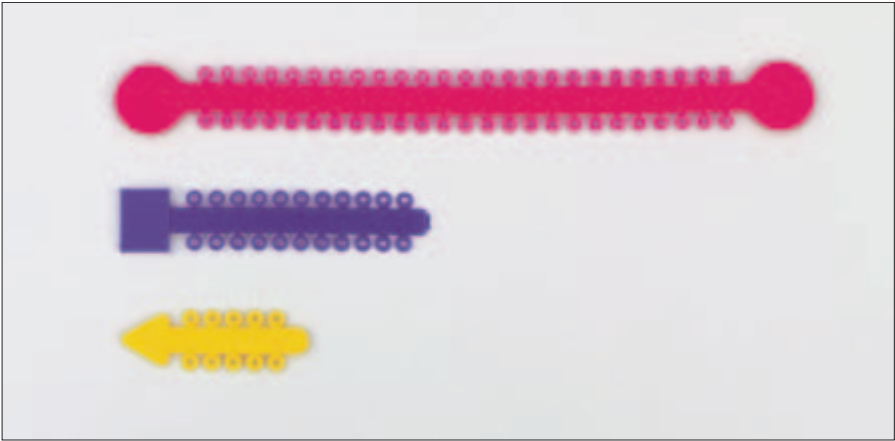


Figure 16.8

FIGURE 16.7**Name**

- Orthodontic archwire

Function and mechanism of action

- Archwires are tied into orthodontic brackets that have been previously bonded to teeth, and these act as a track to facilitate movement of teeth
- The archwire is pre-formed. When tied into the bracket its shape may be altered. This results in force being applied to the teeth as the archwire tries to regain its original shape

Varieties

- Available in different shapes and diameters
- Made from many different materials e.g. stainless steel, nickel titanium

FIGURE 16.8**Name**

Elastomeric modules

Function and directions for use

- Used to ligate or hold the orthodontic archwire in place
- Used with mosquito artery forceps or Mathieu ligature pliers to place around orthodontic brackets
- One use and changed each time the archwire is changed

Varieties

- Can be made from a variety of materials
- Available in many colours



Figure 16.9



Figure 16.10

FIGURE 16.9 a, b**Name**

Ligatures

Function and directions for use

- Used to ligate or hold the orthodontic archwire in place
- Used with mosquito artery forceps or Mathieu ligature pliers to place around orthodontic brackets
- Changed each time the archwire is changed
- The excess ligature wire is cut with various orthodontic pliers and should be disposed of in the sharps' bin
- One use

Varieties

- Can be made from a variety of materials
- Different types (a) long ligature (b) 'quick ligs', and Kobayashi tie hooks that facilitate tying elastics around

FIGURE 16.10**Name**

Patient relief wax (bee's wax)

Function

Given to the patient after fixed appliance placement to help relieve discomfort from tissue trauma



(a)



(b)

Figure 16.11

ORTHODONTIC INSTRUMENTS**FIGURE 16.11****Name**

Separator placing pliers

Function and features

- Used for placing elastic separators interproximally
- Single-ended instrument – handle is adapted for a palm grasp

Varieties

Different sizes and shapes are available

False friends

Rubber dam clamp forceps and Coons ligature pliers

FIGURE 16.12**Name**

Johnsons contouring pliers

Function and features

- Used to re-contour and adapt an orthodontic band to a tooth
- Beaks are tapered with a slight bow
- One beak is concave while the other is convex allowing re-contouring of bands

Varieties

Shape of beaks may vary



Figure 16.12



Figure 16.13



Figure 16.14



Figure 16.15

FIGURE 16.13**Name**

Nylon band seater

Function and features

- Used for the patient to bite to facilitate the seating of an orthodontic band
- Edge of the tip is serrated to facilitate grip
- Autoclavable

Varieties

Many shapes and sizes available

FIGURE 16.14**Name**

Mershon band pusher

Functions and features

- Aid in the placement and seating of orthodontic bands
- Can be used to adapt the coronal portion of the band to the tooth
- Handle is designed to allow better operator grasp

False friend

Couplands chisel

FIGURE 16.15**Name**

Posterior band remover

Function, features and method of use

- Used to remove posterior orthodontic bands
- Two stainless steel beaks, one may have a nylon tip (may be replaceable)
- When removing a band, the nylon tip is placed on the occlusal surface, and the curved beak is placed at the gingival edge of the band

Varieties

- Different sizes and shapes available
- Tip may be metal instead of nylon



Figure 16.16



Figure 16.17



Figure 16.18

FIGURE 16.16**Name**

Bracket holder

Function

- Securely grasps the orthodontic bracket during placement
- Applying pressure opens working end and releasing closes working end

Varieties

- Different sizes and shapes available
- Control mechanism may vary

FIGURE 16.17**Name**

Weingart pliers

Functions and feature

- Used to guide and move the archwire in and out of placement
- Used to hold the archwire during bending
- The bend in the beak facilitates easy grasping of the archwire and guiding into buccal tubes

Varieties

Different shapes and sizes of beaks available

FIGURE 16.18**Name**

Ligature tucker/ligature director

Function and feature

- Used to tuck excess ligature wire out of the way to reduce tissue trauma
- Notch in working end allows operator to apply pressure to archwire to bend it into place

Varieties

- Can be single-ended or double-ended
- Different sizes and shapes of working ends

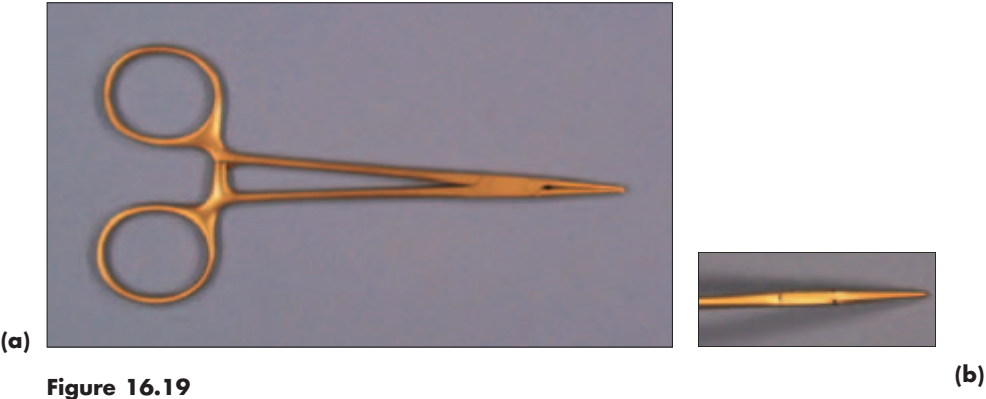


Figure 16.20



Figure 16.21

FIGURE 16.19 a, b**Name**

Mosquito artery forceps – straight

Function and feature

- Used to grasp and place orthodontic separators, power chain and modules
- Beak is serrated for better grasp

Varieties

Different sizes and shapes are available

False friends

Beebe crown scissors/shears, needle holders

FIGURE 16.20**Name**

Mathieu ligature pliers

Function and features

- Used to grasp and place ligature wires and elastics
- Beaks are serrated for better grasp
- The handle has a locking mechanism and a spring mechanism that help the operator to quickly open and close the pliers

Varieties

Beaks can vary in length and angle

FIGURE 16.21**Name**

Coon's ligature pliers

Function

Used to tie long ligatures into a 'figure-of-eight'

Varieties

Various angles and sizes of beaks

False friends

Rubber dam clamp forceps and separator placing pliers



Figure 16.22



Figure 16.23



Figure 16.24

FIGURE 16.22**Name**

Distal end cutter

Function and features

- Used to cut the distal portion of an orthodontic archwire
- Can be used extra-orally (prior to placement)
- Can be used intra-orally (after placement)
- There is a 'safety' mechanism to hold the cut archwire so it does not fall into the patients mouth

Varieties

Various angles and sizes of beaks

FIGURE 16.23**Name**

Ligature cutter

Function and features

- Used to cut ligature wires (not to be used on ligatures more than 0.015mm in diameter as it damages the cutting edge)
- Can also be used to cut elastics and power chains
- Edges are sharp and can be sharpened when they become dull

Varieties

- Variety of beaks and cutting angles
- Some may have replaceable beaks

FIGURE 16.24**Name**

Triple beak pliers

Functions

- Used to place a bend in an orthodontic archwire
- Used to contour and shape an orthodontic archwire

Varieties

Beaks may vary in size and shape



Figure 16.25



Figure 16.26

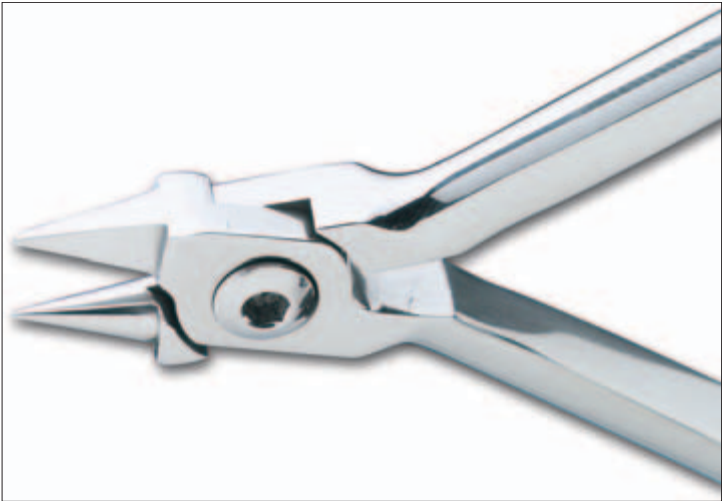


Figure 16.27

FIGURE 16.25**Name**

Omega pliers

Function and feature

- Used to bend and form loops in orthodontic archwires
- Grooves in beaks facilitate bending loops into archwires
- Used to bend removable appliance wires

Varieties

Beaks may vary in size and shape

FIGURE 16.26**Name**

Nance pliers

Function

Used to hold and bend orthodontic archwires

Varieties

Beaks may vary depending on the type of archwire to be bent

FIGURE 16.27**Name**

Light wire pliers

Function

Used to bend and place loops in an orthodontic archwire

Varieties

Variety of beaks

False friend

Adams spring forming pliers



Figure 16.28



Figure 16.29



Figure 16.30

FIGURE 16.28**Name**

Tweed pliers

Function and feature

- Used to bend and form loops in orthodontic archwires
- Grooves in beaks facilitate bending loops into archwires

FIGURE 16.29**Name**

How(e) pliers

Functions and features

- Multipurpose orthodontic pliers
- A long beak with serrated tips for grasping
- Can be used to grasp bands and archwires during placement and removal, and to tie metal ligatures

Varieties

Beaks may vary in size and shape

FIGURE 16.30**Name**

Mitchells trimmer

Functions

- Used after placement of orthodontic bands to remove excess cement
- Can be used after de-bonding brackets in the removal of excess cement with a conventional handpiece and a de-bonding bur

False friends

Hollenback 3½ carver, Wards carver



Figure 16.31



Figure 16.32



Figure 16.33

FIGURE 16.31**Name**

Adams spring forming pliers

Functions and features

- Used to adjust springs on orthodontic removable appliances
- Can be used to smooth and contour archwires
- One beak is rounded, the other is square/flat ended

Varieties

- Beaks may vary in size and shape

False friend

Light wire pliers

FIGURE 16.32**Name**

Adams universal pliers

Function

Used to adjust headgear, face bows and Adams clasps on removable appliances

Varieties

Different sizes are available

False friend

Adams spring forming pliers

FIGURE 16.33**Name**

Mauns heavy duty wire cutter

Function

To cut heavy archwires or appliance wires – used extra-orally

Varieties

Different sizes and shapes of beaks are available

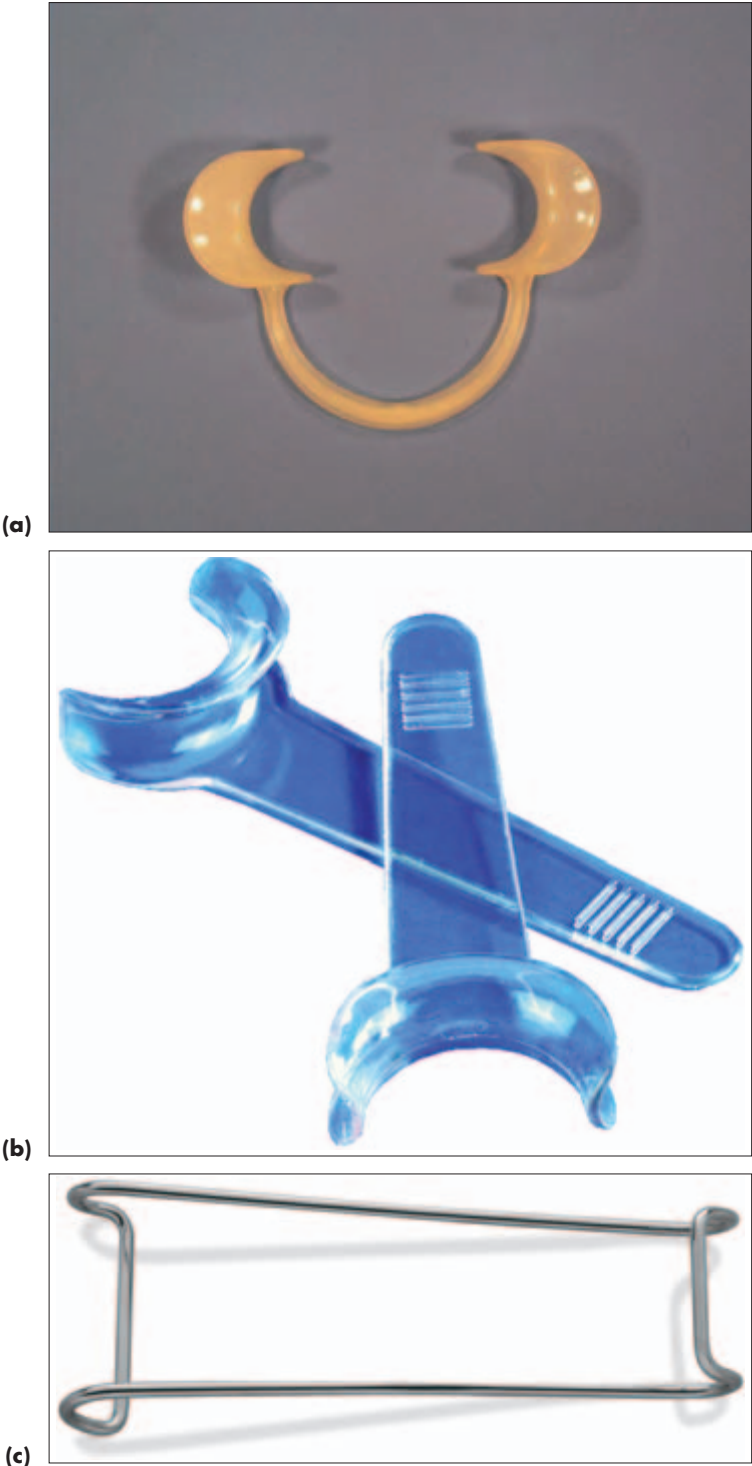


Figure 16.34

MISCELLANEOUS ITEMS**FIGURE 16.34 a, b, c****Name**

Cheek retractors

Functions

- To retract cheeks and lips for better visibility
- Often used when bonding fixed appliances and taking photographs

Varieties

- Different sizes and shapes available
- Plastic and metal types available

FIGURE 16.35**Name**

Intra-oral mirrors

Function

- Aid in visibility when taking intra-oral photographs
- Often used in conjunction with cheek retractors

Varieties

Different sizes and shapes available



Figure 16.35

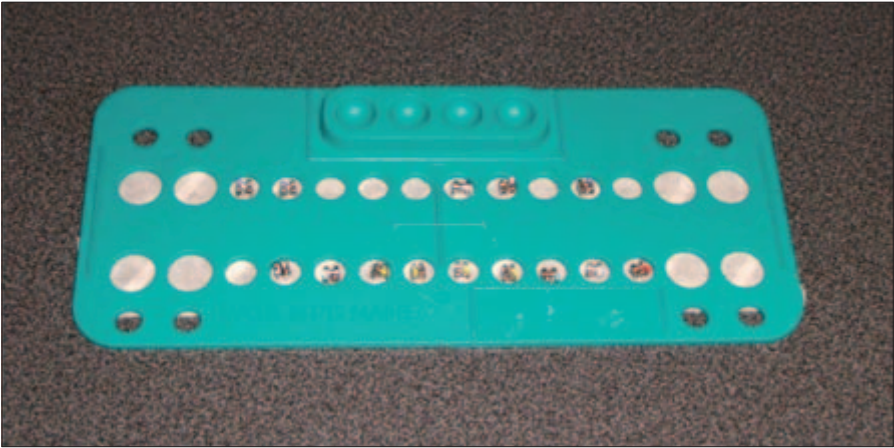


Figure 16.36

FIGURE 16.36**Name**

Orthodontic bracket card

Function and features

- Used to organise and hold orthodontic brackets to facilitate quick bracket placement
- Each circle on the card corresponds to a particular tooth in the mouth
- Brackets are placed corresponding to the tooth to be bonded
- Tape on the back of the card helps to keep brackets in place

Set-ups

The following instruments are common to all the below listed set-ups

- Mouth mirror and handle (p. 33)
- Sickle/contra-angled probe (p. 35)
- College tweezers (p. 37)
- Hand mirror

Separator placement:

- Dental floss
- Elastomeric separators
- Separator placing pliers

Band placement:

- (Separators placed one week in advance of this appointment)
- Orthodontic bands
- High volume suction (p. 41)
- Low volume suction/saliva ejector (p. 41)
- Prophy handpiece (p. 71)
- Rubber cup (p. 80)
- Pumice
- Orthodontic bands
- Mershon band pusher
- Contouring pliers
- Posterior band remover
- Nylon band seater
- Cotton wool rolls (p. 43)
- Glass ionomer cement
- Weston spatula (p. 89)
- Mitchell trimmer
- Air/water syringe/3-in-1 syringes (p. 45)

Bracket placement:

- Instructions for care of new fixed appliance
- Orthodontic brackets, bands, archwire, elastics, power chain and ligatures
- High volume suction, low volume suction/disposable saliva ejector (p. 41)
- Air/water syringe/3-in-1 syringe (p. 45)
- Prophy handpiece, prophy cup and flour of pumice (pp. 71, 80)
- Cheek retractors (p. 229)
- Acid etch
- Bonding agent
- Dappen dish (p. 91)
- Composite gun (p. 99)
- Composite (p. 99)
- Curing light (p. 105)
- Teflon-tipped flat plastic (p. 101)
- Bracket holders

- Orthodontic archwire
- Ligature tucker
- Ligature cutter
- Distal end cutter
- Mosquito artery forceps
- Elastomeric modules
- Ligatures
- Johnson contouring pliers, Weingart, Tweed and triple beak pliers – depending on operator's preference

Archwire change:

- Weingart pliers
- Distal end cutter
- Ligature tucker
- Ligature cutter

De-bond, fixed appliance removal:

- Posterior band remover
- Conventional handpiece and de-bonding bur
- Mitchell trimmer
- How(e) pliers
- Posterior band remover

If patient will need a removable appliance:

- Impression materials
- Impression trays, adhesive, mixing spatula, mixing bowl and water measure (p. 197)
- Laboratory prescription and bag

Delivery of removable appliance:

- Straight handpiece
- Acrylic burs
- Adams pliers
- Mauns heavy duty wire cutter
- Appliance box
- Instructions on care of new appliance
- Hand mirror

Appliance adjustment:

- Straight handpiece (p. 69)
- Acrylic burs (p. 79)
- Adams universal pliers
- Adams spring forming pliers
- Mauns heavy duty wire cutter
- Miller's forceps (p. 107)
- Articulating paper (p. 107)

SECTION 17

INSTRUMENTS USED IN PERIODONTAL PROCEDURES

Maintenance of the health of the periodontium (gingiva, periodontal ligament and alveolar bone) is vital for an individual's overall dental health. Disease of the periodontium is referred to as periodontal disease and is a common dental problem. The dental team uses specialised instruments to maintain good periodontal health or to reverse the effects of periodontal disease.





Figure 17.1



Figure 17.2

VARIOUS PERIODONTAL PROBES**FIGURE 17.1****Name**

Williams periodontal probe

Function and feature

- Used to probe the depth of a periodontal pocket, allowing the operator to measure the pocket depth by reading the markings
- Working end is marked in millimetres to measure periodontal pockets around teeth (can probe depths as small as 0.4 mm)

Varieties

- Can be single-ended or double-ended
- Many different types of periodontal probes available

False friends

Endodontic probe (DG16 probe), endodontic spreader, BPE/CPITN probe

FIGURE 17.2 a, b**Name**

BPE/CPITN probe (BPE, Basic Periodontal Examination; CPITN, Community Periodontal Index of Treatment Needs)

Function and features

- Ball on working end helps to prevent tissue trauma and detect sub-gingival calculus
- The coloured bands are for measuring the depth of periodontal pockets
- The measurements recorded will indicate to the operator the level of periodontal treatment needed
- Calibrated in millimetres

False friend

Periodontal probe

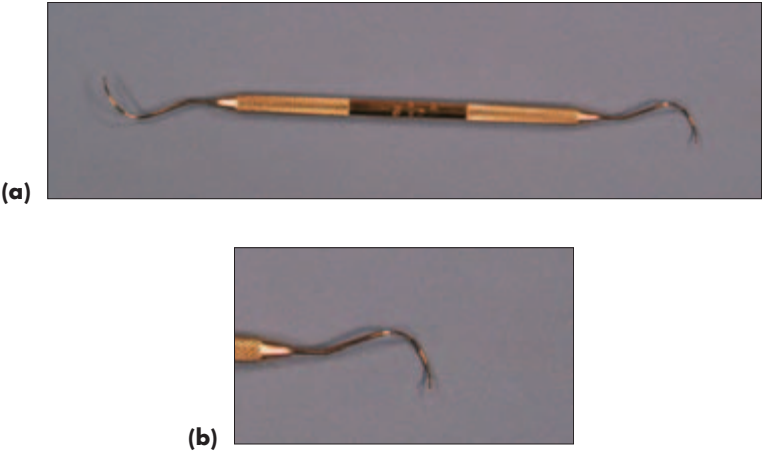


Figure 17.3

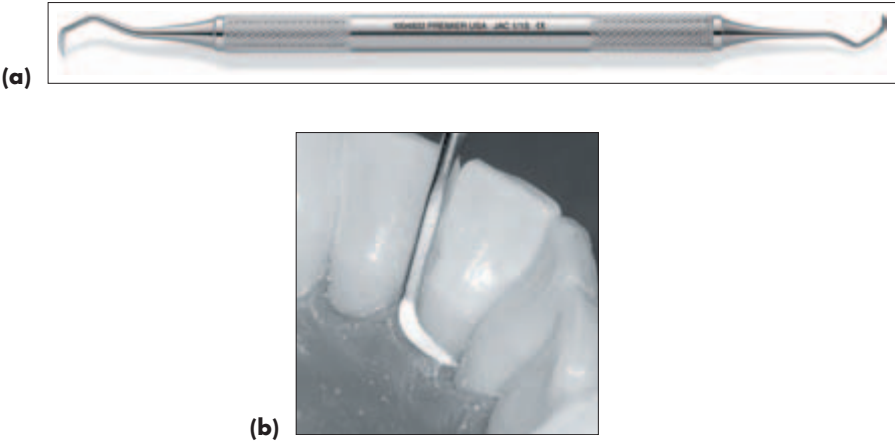


Figure 17.4

FIGURE 17.3 a, b**Name**

Furcation probe

Functions and features

- To examine tooth surfaces and detect imperfections in furcations, pit, fissures, interproximal areas and around restorations
- Measures the depth of furcation involvement
- There is a pointed working end calibrated in millimetres (denoted by black markings)

Varieties

- Can be single-ended or double-ended
- Variety of working ends

SCALERS AND CURETTES**FIGURE 17.4 a, b****Name**

Jacquette scaler

Function, features and method of use

- Used with a pull action
- To remove supra-gingival calculus and plaque
- Two cutting edges that meet at a point
- Needs to be sharpened regularly

Varieties

- Can be single-ended or double-ended
- Many different types are available

False friends

Gracey curettes

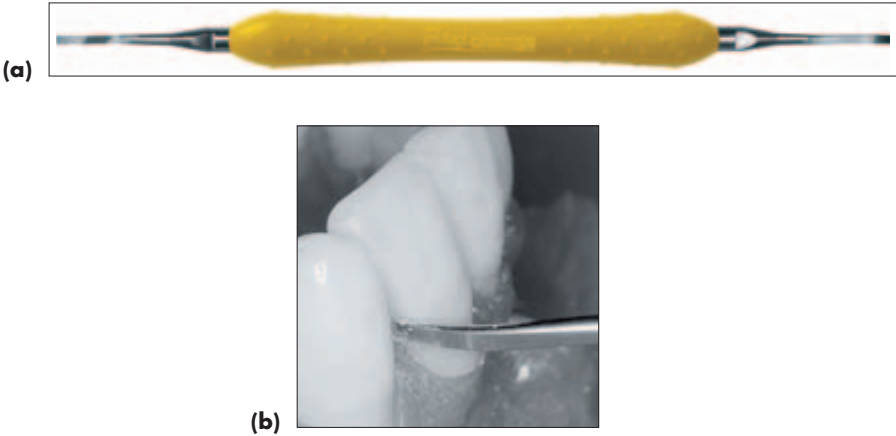


Figure 17.5

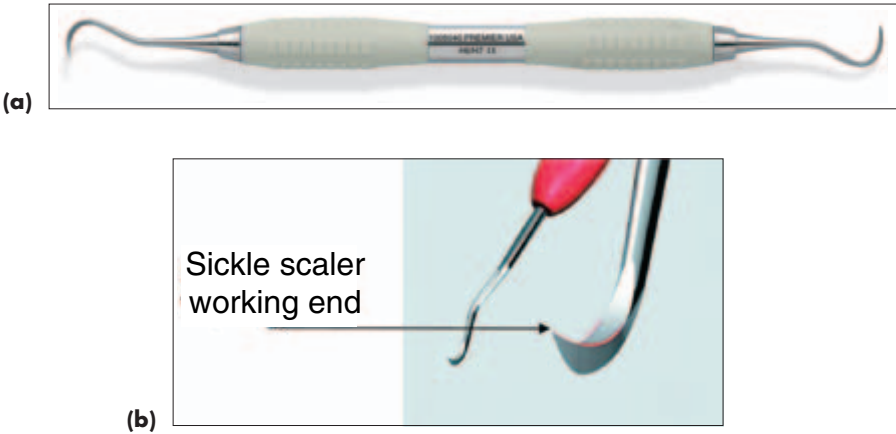


Figure 17.6

FIGURE 17.5 a, b**Name**

Push scaler

Function and method of use

- Used with a push action
- To remove supra-gingival calculus and plaque

Varieties

Can be single-ended or double-ended

False friends

Enamel chisel, enamel hatchet

FIGURE 17.6 a, b**Name**

Sickle scaler

Function and features

- To remove supra-gingival calculus and plaque
- Two cutting edges that meet at a point
- Needs to be sharpened regularly

Varieties

- Available as anterior or posterior instruments with a variety of working ends
- Can be single-ended or double-ended

False friends

Sickle/contra-angled probe, Gracey curettes

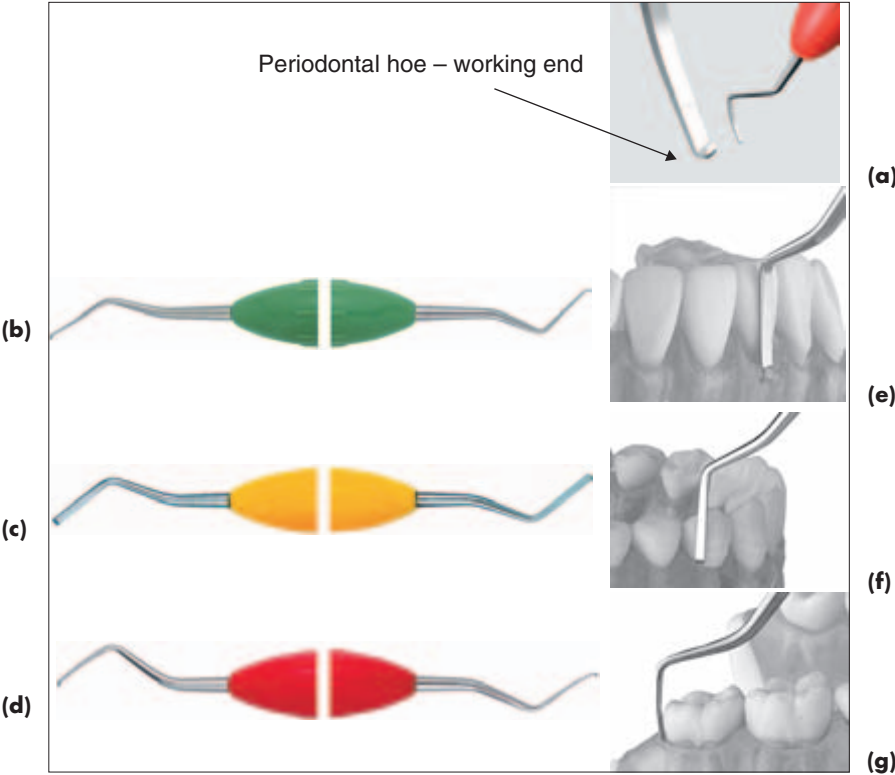


Figure 17.7

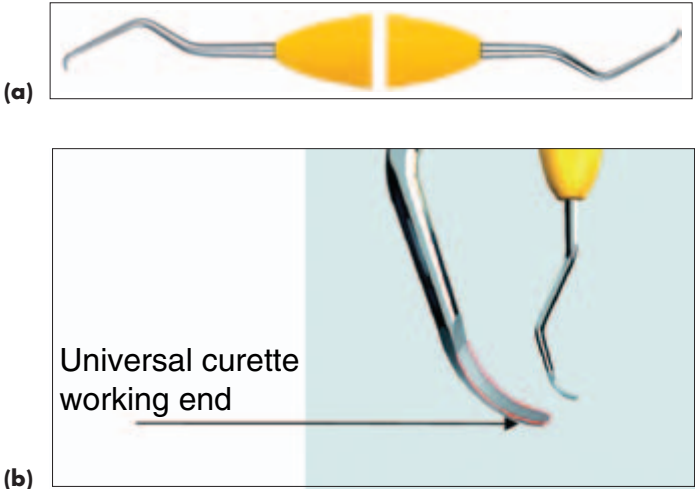


Figure 17.8

FIGURE 17.7 a, b, c, d, e, f, g**Name**

Periodontal hoes

Function and method of use

- To remove supra-gingival and sub-gingival calculus and plaque
- Used with a push-pull action
- May have tungsten carbide working ends for added strength

Varieties

- Can be available as different types for working in specific areas (anterior, buccal/lingual surfaces and posterior)
- Can be single-ended or double-ended

False friends

Push scaler, enamel chisel

FIGURE 17.8 a, b**Name**

Universal curette

Function and features

- Used to remove stains, supra-gingival and sub-gingival calculus and plaque, and used in root planing
- Designed to adapt to all areas and surfaces of the mouth
- The working ends are usually mirror images of each other (double-ended instrument) and are perpendicular to the lower shank
- There are two cutting edges that meet at a rounded working end

Varieties

Can be single-ended or double-ended

False friend

Scalers

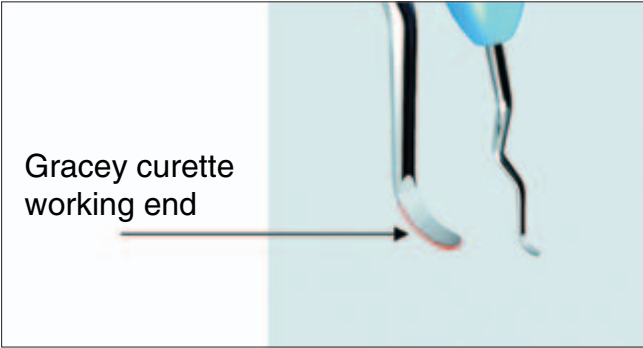
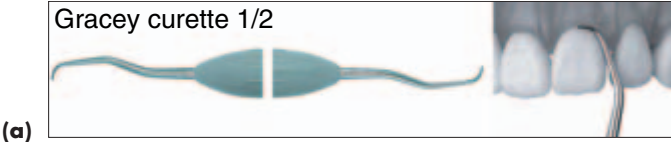
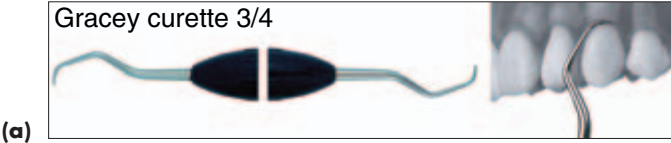


Figure 17.9



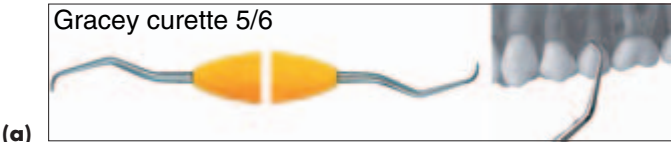
(a)

(b) Figure 17.10



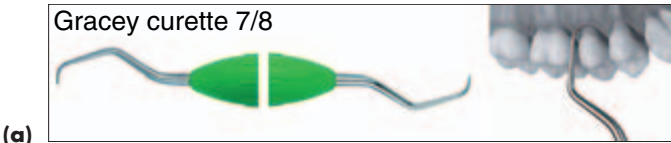
(a)

(b) Figure 17.11



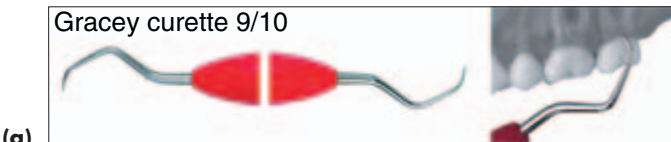
(a)

(b) Figure 17.12



(a)

(b) Figure 17.13



(a)

(b) Figure 17.14

**FIGURES 17.9: 17.10 a, b; 17.11 a, b; 17.12 a, b;
17.13 a, b; 17.14 a, b; 17.15 a, b; 17.16 a, b**

Name

Gracey curettes

Function and features

- Designed to adapt to specific areas in the mouth
- An operator will need a full set of instruments to work in all areas of the mouth
- Have one cutting edge and a rounded working end
- Used to remove stains, sub-gingival calculus, and for root planing
- The name of the instrument consists of a name (usually indicating the person, institution etc. who designed the instrument) followed by two numbers (if the instrument is double-ended) that refer to the working ends
- If the instrument has two numbers on the handle, each number refers to the working end that it is closest to
- The number indicates the specific area the Gracey curette will be used in:
 - Gracey 1/2, 3/4 (Figures 17.10, 17.11) – incisors and canines
 - Gracey 5/6 (Figure 17.12) – premolars
 - Gracey 7/8, 9/10 (Figures 17.13, 17.14) – buccal and lingual surfaces of the posterior teeth
 - Gracey 11/12 (Figure 17.15) – mesial surfaces of posterior teeth
 - Gracey 13/14 (Figure 17.16) – distal surfaces of posterior teeth
- Need to be sharpened regularly with a sharpening stone, or they can be professionally sharpened

Varieties

- Many types of curettes are available (mini, macro, standard and rigid Gracey curettes)
- Can be single-ended or double-ended

False friends

Scalers

Figure 17.15

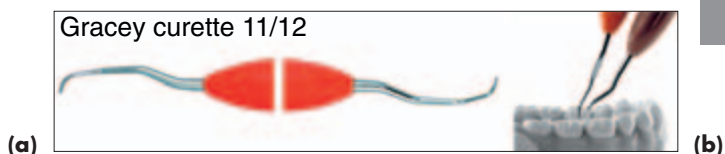


Figure 17.16

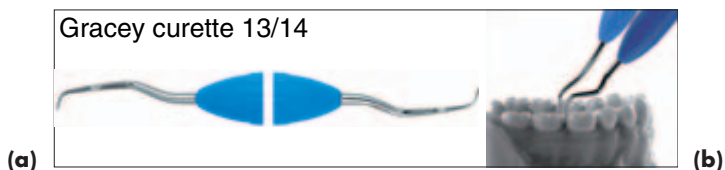




Figure 17.17

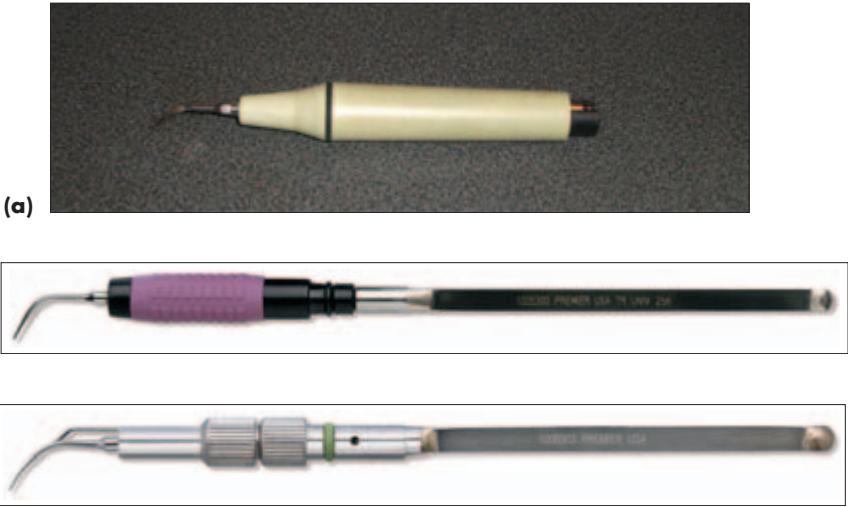


Figure 17.18

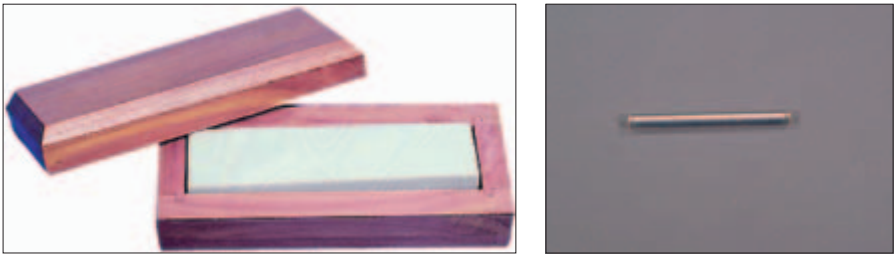


Figure 17.19

INSTRUMENTS USED IN PERIODONTAL PROCEDURES

FIGURE 17.17 a, b**Name**

Implant scalers

Function and feature

- Used to remove plaque, calculus and stains from implants
- Designed so as not to cause damage to or scratch the implant
- Available with gold tipped working end or plastic so the implant will not be damaged or scratched

Varieties

Many different sizes and shapes available

FIGURE 17.18 a, b, c**Name**

Ultrasonic scaler tips

Function and features

- Used in conjunction with an ultrasonic scaling unit to remove stains, plaque and calculus (using ultrasonic waves)
- Water is used with this instrument
- Handle fits on the dental unit
- The ultrasonic tips are interchangeable

Varieties

- Different tips are available depending on use, e.g. sub-gingival, universal
- Many different makes and systems available (e.g. Cavitron)

MISCELLANEOUS EQUIPMENT**FIGURE 17.19 a, b****Name**

(a) Sharpening stone (b) Plastic test stick

Functions and importance

- A sharpening stone is used to grind, sharpen and smooth the working ends of sharp hand instruments (can be used with a sharpening oil)
- A sharp instrument facilitates easier removal of deposits, reduces time needed to clean, minimises patient discomfort, improves tactile sensitivity of the operator and reduces hand fatigue for the operator
- A plastic test stick is used to check that the working end is sharp

Varieties

Sharpening stones are available in different grits, sizes and shapes



Figure 17.20



Figure 17.21

FIGURE 17.20**Name**

Disposable prophy angle attachments (please see Section 7 for conventional handpiece, rubber polishing cups and bristle brush)

Function and features

- Used to polish teeth
- Single use
- Designed for infection control purposes
- Attach to conventional handpiece

Varieties

Many different sizes and shapes available

FIGURE 17.21**Name**

Prophy ring

Function

Used to hold unidose prophy paste during rubber cup polishing

Varieties

Various sizes and shapes available from different manufacturers

Set-ups

The following instruments are common to all the below listed set-ups

- Mouth mirror and handle (p. 33)
- Periodontal probe (p. 35)
- Sickle/contra-angled probe (p. 35)
- College tweezers (p. 37)
- Hand mirror
- Furcation probe

Routine periodontal recall:

- Sickle scaler
- Various Gracey curettes
- Arkansas sharpening stone
- Plastic test stick
- Prophy handpiece (p. 71)
- Rubber polishing cup (p. 80)
- Prophy paste and/or flour of pumice

Root planing

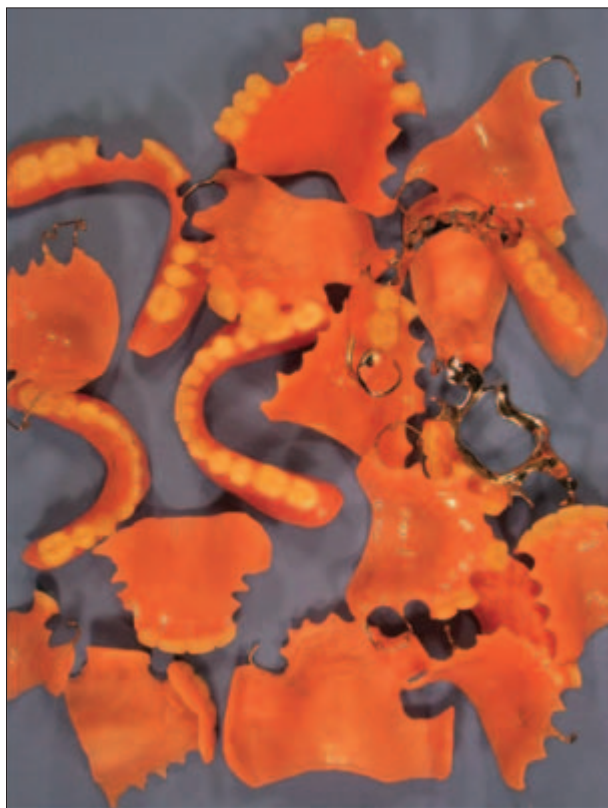
- Local anaesthetic set-up if required (see Section 5, p. 47)
- Sickle scaler
- Various Gracey curettes
- Ultrasonic scaler
- Arkansas sharpening stone
- Plastic test stick
- Prophy handpiece (p. 71)
- Rubber polishing cup (p. 80)
- Prophy paste or flour of pumice
- Air/water syringe/3-in-1 syringe (p. 45)
- High volume suction, low volume suction/saliva ejector (p. 41)

SECTION 18

INSTRUMENTS USED IN REMOVABLE AND FIXED PROSTHODONTICS

Prosthetic dentistry involves the 'prosthetic' or 'false' replacement of natural teeth. There are two divisions of prosthetic dentistry:

- Fixed prosthodontics: The prostheses cannot be removed by the patient, which includes crowns, bridges, implant restorations, veneers and inlays
- Removable prosthodontics: The prostheses can be removed by the patient, which includes full and partial dentures



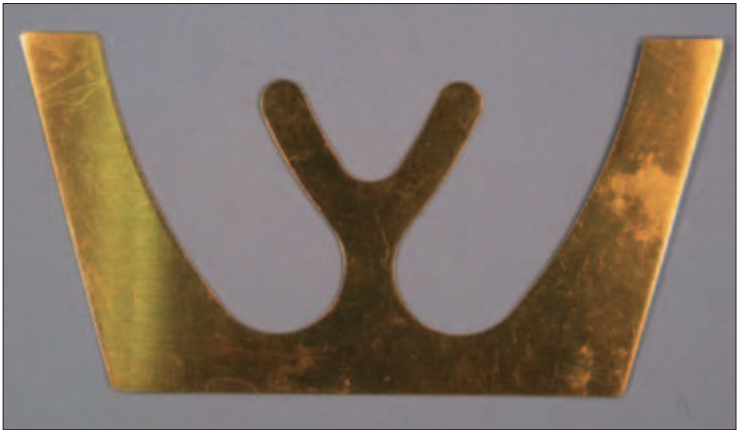


Figure 18.1

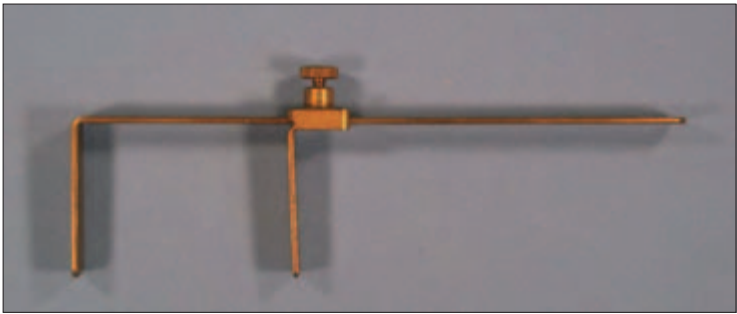


Figure 18.2



Figure 18.3

FIGURE 18.1**Name**

Fox's occlusal plane guide

Functions and indications

- Used with edentulous patients
- Used during the jaw relationship stage of denture construction
- Used to check that the incisal line is in a horizontal plane and that the sides are parallel with a line joining the ala of the nose and the tragus of the ear (the ala-tragal line)
- Always used when the patient is sitting upright

FIGURE 18.2**Name**

Willis bite gauge

Function

- Used to measure vertical dimension
- Used during patient assessment and the jaw relationship stage in denture construction

This is how the operator can tell if the edentulous patient's mouth is over-closing or not closing enough during the stage of bite registration

FIGURE 18.3**Name**

Paint scraper

Function

Used in conjunction with a heat source to soften and smooth wax rims while recording the patient's occlusion during the jaw relationship stage of denture construction



Figure 18.4



(a)



(b)

Figure 18.5



Figure 18.6

FIGURE 18.4**Name**

Le Cron carver

Function

Used for fine trimming of wax at various stages of denture construction

False friends

Hollenback $3\frac{1}{2}$ carver, Wards carver, Mitchell trimmer

FIGURE 18.5 a, b**Name**

Wax knife

Function

For trimming wax during denture construction

FIGURE 18.6**Name**

Red ribbon wax

Function

- Used during construction of dentures, crowns and bridges
- Can be used to extend the length or height of impression trays



Figure 18.7



Figure 18.8



Figure 18.9

FIGURE 18.7**Name**

Bite registration paste

Function

Used in conjunction with wax rims to record a patient's occlusal relationship

Varieties

Available in different types and thicknesses

FIGURE 18.8**Name**

Modelling wax

Function and method of use

- Used to record a jaw relationship
- May be softened under warm water or used in conjunction with a heat source

Varieties

Available in different types and thicknesses

FIGURE 18.9**Name**

Greenstick composition

Function

Heated and softened to extend the periphery of an impression tray, commonly used for border molding



Figure 18.10

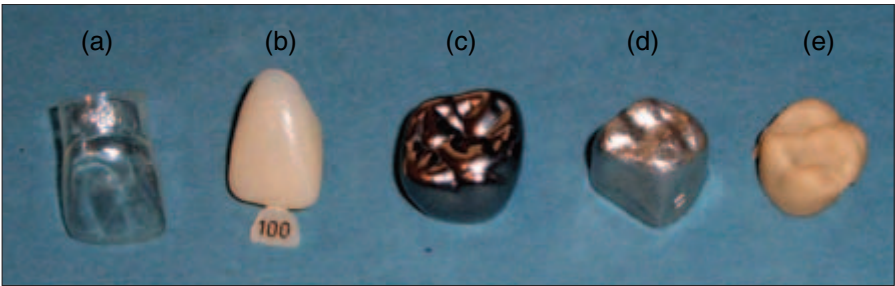


Figure 18.11



Figure 18.12

FIGURE 18.10**Name**

Green occlusal indicating wax

Function

To check the occlusal relationship of upper and lower teeth

Varieties

Available in different delivery systems

FIGURE 18.11 a, b, c, d, e**Name**

Crown forms:

- (a) Acetate/clear crown form (celluloid)
- (b) Polycarbonate crown form
- (c) Stainless steel crown form
- (d) Aluminium crown form
- (e) Temporary/provisional crown fabricated chairside

Functions

- Used as temporary/provisional crowns during permanent crown fabrication
- Protect the prepared tooth from trauma and sensitivity
- Help to prevent drifting and maintains occlusion with other teeth
- Esthetically pleasing
- Cemented with a temporary cement

Varieties

Available in different sizes and shapes

FIGURE 18.12**Name**

Beebe crown scissors/shears

Function

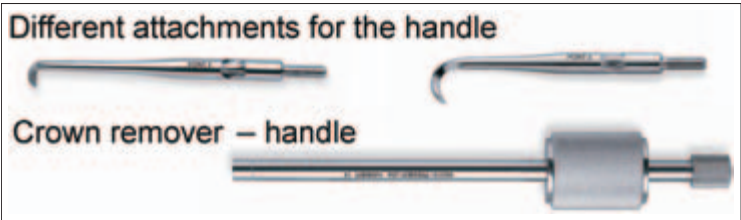
Cutting and trimming various materials, e.g. rubber dam septa, provisional/temporary crowns

Varieties

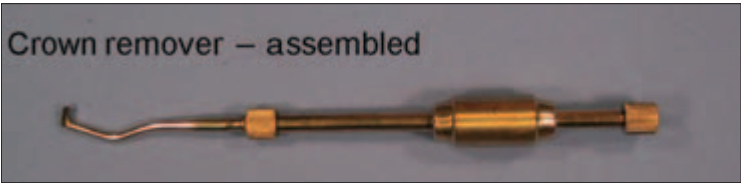
Various shapes and sizes are available



Figure 18.13



(a)



(b)

Figure 18.14



(a)



(b)



(c)

Figure 18.15

FIGURE 18.13**Name**

Johnson contouring pliers

Function and features

- Used to re-contour and adapt stainless steel crowns
- Beaks are tapered with a slight bow
- One beak is concave and the other is convex for re-contouring crowns

Varieties

Shapes of beaks may vary

FIGURE 18.14 a, b**Name**

Crown remover

Function and method of use

- Used to remove cemented crowns
- Beak of instrument is placed at the gingival margin of the crown while the weight on the handle is lightly tapped
- The light tapping may result in enough force to remove the crown

FIGURE 18.15 a, b, c**Name**

Cord packer/gingival retraction cord instrument

Functions

- Used to 'pack' gingival retraction cord into the sulcus prior to taking a final impression
- Can be used to retract tissues if access to a restoration is limited

Varieties

Working ends are available in many different sizes and shapes



Figure 18.16



Figure 18.17



Figure 18.18

INSTRUMENTS USED IN REMOVABLE
AND FIXED PROSTHODONTICS

FIGURE 18.16**Name**

Gingival retraction cord

Function and direction for use

- Packed into the gingival sulcus to retract the gingiva, to get an accurate impression of the prepared crown margins
- Can be soaked in a haemostatic agent to control bleeding as most impression materials are moisture sensitive

Varieties

Available in different thicknesses, in single dose packets or a strand that must be cut to required size

FIGURE 18.17**Name**

Pre-fabricated/pre-formed post kit

Function and kit contents

- Used after root canal treatment to help retain the build-up on the tooth
- The kit contains post drills and pre-fabricated posts

Varieties

- Many different types available
- Cast posts can be fabricated where indicated

FIGURE 18.18 a, b**Name**

Wooden-handled impression spatulas

Function

For mixing impression materials



Figure 18.19



Figure 18.20

FIGURE 18.19**Name**

Fish tail spatula

Function

For mixing alginate impression materials

FIGURE 18.20**Name**

Plaster spatula

Function

For mixing plaster and stone materials

Set-ups

Fixed Prosthodontics

(Note: Many instruments listed here may be illustrated in other sections due to their multiple functions)

The following instruments are common to all the below listed set-ups:

- Mouth mirror and handle (p. 33)
- Sickie/contra-angled probe (p. 35)
- College tweezers (p. 37)
- High and low volume/disposable saliva ejector suction tips (p. 41)
- Cotton wool rolls (p. 43)
- Local anaesthetic set-up (see Section 5, p. 47)
- Floss
- Miller forceps and articulating paper (p. 107)

Inlays, crowns and bridges:

First visit:

- Turbine handpiece and burs (see Section 7, p. 65)
- Conventional handpiece and burs (see Section 7, p. 65)
- Mandrels and discs (p. 79)
- Impression materials, impression trays and adhesive material (opposing arch impression) (see Section 15, p. 195)
- If a restoration is needed – see set-up in Section 8, p. 110
- Temporary filling material or temporary/provisional crown or bridge material (p. 259)
- Laboratory prescription and laboratory bag
- Method for disinfection prior to sending to the laboratory
- Shade guide
- Gingival retraction cord
- Flat plastic instrument
- Waxes

Second visit:

- Mosquito artery forceps
- Gauze to protect patient's airway during cementation
- Cement for permanent cementation, e.g. zinc phosphate
- Turbine handpiece and burs (see Section 7, p. 65)
- Conventional handpiece, prophy cup, pumice and burs (see Section 7, p. 65)
- Mixing spatula and paper pad
- Shimstock

Removable Prosthodontics

The following instruments are common to all the below listed set-ups:

- Mouth mirror and handle (p. 33)

- Sickle/contra-angled probe (p. 35)
- College tweezers (p. 37)
- Ball burnisher (p. 95)
- Bowl of water to keep old denture moist
- Method for disinfection prior to sending to the laboratory

Denture fabrication: (if the construction is for replacement of dentures, a soft reline may be needed to restore tissue health)

First visit:

- Impression materials, impression trays and adhesive material
- Willis bite gauge
- Laboratory prescription and laboratory bag
- Shade guide

Second visit:

- Custom trays/special trays (made by the laboratory) (p. 199)
- Impression materials, impression trays and adhesive material
- Laboratory prescription and laboratory bag

Third visit:

- Wax rims (made by laboratory)
- Fox occlusal plane guide
- Paint scraper
- Heat source
- Le Cron carver
- Wax knife
- Bite registration paste
- Laboratory prescription and laboratory bag

Fourth visit:

- Denture teeth set in wax try-in (made by laboratory)
- Le Cron carver
- Wax knife
- Fox occlusal plane guide
- Laboratory prescription and laboratory bag
- Hand mirror

Fifth visit:

- Final dentures – fitting (made by laboratory)
- Straight handpiece and acrylic burs (see Section 7, p. 65)
- Pressure-indicating paste
- Miller forceps and articulating paper (p. 107)
- Instructions on home care and a box for the new denture

APPENDIX

The following tables and list of items are used for the spotter test by the National Examining Board for Dental Nurses (NEBDN) UK, current at the time of publication. Twenty items are chosen from the list and the dental nurse will have to identify them during the National Exam using precise terminology. Please contact the National Examining Board for Dental Nurses for further information on this examination (website: www.nebdn.org).

Impression trays

Upper	Dentate	Disposable
Lower	Edentulous	Metal

How to describe the tray

E.g. Upper dentate disposable impression tray

Burs

Round	Steel	Friction grip (FG)	• Acrylic
Flat fissure	Diamond	Latch grip (LG)	• Pear
Tapered fissure	Tungsten carbide (TC)	Straight handpiece (HP)	• Bud
Flame			
• Pear			
• Bud			
• Inverted cone			

How to describe/name a bur

E.g. Round steel LG bur, Tapered fissure TC FG bur, Pear-shaped acrylic bur

Adams universal pliers	BPE/CPI/TN probe
Airway	Briault probe
Amalgam burnisher	Bristle brush, latch grip/LG
Amalgam plugger	Couplands chisel
Articulating paper	Crown form:
Austin retractor	• Polycarbonate
Ball-ended burnisher	• Acetate/clear/transparent
Barbed broach	• Aluminium
Beebe crown shears	• Stainless steel
Blake gingivectomy knife handle	Cryer elevator
Bone rongeurs	Curette scaler

Continued

Disposable saliva ejector

Dry Guard

Enamel chisel

Finger spreader

Flat plastic instrument

Forceps:

- Lower molar
- Lower molar, children's
- Lower roots
- Upper incisor/straight
- Upper left molar
- Upper right molar
- Upper root

Gates Glidden drill

Gingival retraction cord

Green occlusal indicating wax

Greenstick composition

Gutta percha points

Jacquette scaler

Le Cron carver

Matrix strip, clear/transparent

Mauns heavy wire cutter

Mitchell trimmer

Modelling wax

Molar orthodontic band

Molar rubber dam clamp

Moore mandrel

Mouth prop

Needle holders

Occlusal X-ray film packet

Orthodontic bracket

Paper point

Paste filler, rotary/spiral

Periapical X-ray film packet

Periodontal hoe

Periosteal elevator

Plastic wedge

Pocket mask

Polishing/finishing strip

Pop-on mandrel

Push scaler

Radiation monitoring badge

Red ribbon wax

Root canal hand file

Rubber cup, latch grip/LG

Rubber dam clamp forceps

Rubber dam frame

Rubber dam punch

Sickle probe

Siqveland matrix retainer

Stainless steel mixing spatula

Suture needle and silk

Teeth:

- Lower deciduous molar
- Lower permanent incisor
- Lower permanent molar
- Upper first premolar
- Upper deciduous molar
- Upper permanent molar

Tissue dissecting forceps

Tofflemire matrix retainer

Wards carver

Warwick James elevator

Wax knife

Willis bite gauge

Wooden wedge

INDEX

- 3-in-1 syringe 45, 110, 232, 250
- acorn burnisher 95, 103
- acrylic bur 79, 233
- Adams spring forming pliers 227
- Adams universal pliers 227
- air rotor handpiece 67, 109, 142
- air turbine handpiece 67, 109, 142
- air water syringe 45, 110, 232, 250
- aluminium crown form 259
- aluminium spatula, anodised 89
- amalgam capsule 97
- amalgam carrier 91
 - metal
 - plastic
- amalgam safe container 97
- amalgam well 95
- amalgamator 97
- amber shield 105
- anaesthetic cartridge 51
- anodized aluminum composite flat plastic 101
- apex locator 141
- applicators, disposable 46, 87
- archwire, orthodontic 209
- articulating paper 107, 233
- assistina 13
- Austin retractor 165
- autoclave tape 9
- autoclave 9
- automatic film processor 27

- ball burnisher 95, 267
- barbed broach 127
- barriers, non-permeable surface 5
- basic dental instruments features 33
- Bayonet extraction forceps 151
- beavertail burnisher 95
- Beebee crown scissors/shears 64, 109, 124, 259
- bite registration paste 257
- bite-wing radiograph 19
- BiTine ring 115
- Blakes gingivectomy knife handle 183
- blue ring conventional handpiece 71
- blunt scissors 64, 109
- Boley gauge 191
- bone file 160, 173
- bone nibblers 171
- bone rongeurs 171
- bottle brush 11
- Bowdler Henry Rake Retractor 165
- BPE/CPITN probe 237
- bracket holder 217
- briault probe 37
- bristle brush 46, 81
- broad bladed spatula 89
- bur block 81
- bur brush 11
- burnishers 95, 124
 - Acorn
 - Ball
 - Beavertail
 - Egg ball/football
 - T-ball
- burs 73–81
 - acrylic 79
 - bristle brush 81
 - description 75
 - diamond 77
 - friction grip 74
 - grips 74
 - latch grip 77
 - long shank 79
 - mandrels 79
 - parts 73
 - shapes 74
- calcium hydroxide instrument 89
- carvers 93
- cassette, radiograph 21
- Castroviejo needle holder 175
- Celluloid strip 113
 - celluloid strip in place 119
- cephalometric radiograph 21
- cheek retractors 229, 232
- chisels
 - enamel 87
 - Couplands 147
- cleoid-discoid carver 93
- college tweezers 37, 38, 46, 109, 124, 141, 160, 232, 250, 266
 - locking
 - non-locking
- composite flat plastic, Teflon tipped 101
- composite gun 99, 232
- composite material, bulk and capsule 99, 232
- composite polishing strip 99
- contact former 103
- conventional handpieces 71, 109, 142
- coons ligature pliers 219
- cord packer 261
- cotton pellets 43, 141
- cotton wool rolls 43, 232, 266
- couloured identification rings 7
- couplands chisel 147, 160
- cowhorn extraction forceps 159
- crown form, stainless steel 259
- crown forms 259, 266
 - acetate
 - aluminium
 - polycarbonate
 - temporary/provisional
- crown remover 261
- cryers elevators 147
 - left
 - right
- curettes
 - gracey 245
 - universal 243
- curing light 46, 105, 232
 - halogen
 - LED
- custom tray 199, 267

- Dappen dish 46, 91, 232
 disposable
 glass
 DG16 probe 127
 diamond bur 77
 digital radiography 25
 dispensing wells 89
 distal end cutter 221
 dividers 193
 dosimeter 29
 dry aid 43
 dry guard 43
- egg ball/football burnisher 95
 elastic separators 205
 electric motor 69
 electric pulp tester 141
 electric surgical and implant handpiece 73
 elevators
 Cryers 147
 Howarth periosteal 167
 parts of 145
 Warwick James 145, 160
 left
 right
 straight
 enamel chisel 87
 enamel hatchet 87
 endodontic block/ring 139
 endodontic handpiece 73
 endodontic K files 131
 endodontic plugger 135
 endodontic ruler 139
 endodontic set-ups
 extraction forceps 150–159
 bayonet 151
 cowhorn 159
 lower deciduous anterior 159
 lower deciduous molar 159
 lower permanent molar 157
 lower permanent premolar 157
 lower root 157
 upper left permanent molar 153
 upper permanent incisor 155
 upper permanent premolar 155
 upper right permanent molar 153
 upper root 155
 upper straight 155
 extra-oral radiographs 21
 extra-oral x-ray machine 25
- face mask 3
 face shield 3
 fast handpiece 67
 figure of eight calipers 191
 film holder (XCP) 23
 finger spreader 135
 finishing strip 107
 fish tail spatula 265
 flat plastic
 anodized aluminum 101
 stainless steel 64, 91
 Teflon tipped 101, 232
 Fox's occlusal plane guide 253
 friction grip bur 75
- furcation probe 239
- galley pot 160, 181
 Garmer cotton wool roll holders 43, 46
 gates glidden drill 129
 gingival margin trimmers 85
 Distal
 Mesial
 gingival retraction cord instrument 261
 gingival retraction cord 263
 gingivectomy knives 183
 Buck
 Kirkland
 Orban Golmand Fox
 gloves 5
 gracey curettes 245
 green occlusal indicating wax 259
 green ring conventional handpiece 71
 greenstick composition 257
 greyhound extraction forceps
 Guedel airway 187
 gutta percha points 137
- Hawe supermat matrix 115
 handpieces
 air rotor 67
 air turbine 67
 blue ring 71
 endodontic 73
 fast 67
 green ring 71
 high speed 67
 implant 73
 orange ring 71
 prophy 71
 straight 69
 surgical 73
 headgear and face bow 205
 high speed handpiece 67, 109, 142
 high volume suction tip 41, 46, 109, 141, 250, 266
 Hobson's plugger, universal 93
 hoe, periodontal 243
 hollenbach 3½ carver 93
 How(e) pliers 225
- identisfication rings, coloured 7
 implant kit 185
 implant scalers 247
 impression spatula, wooden-handled 263
 impression trays
 custom 199
 metal 197, 233
 plastic 197, 233
 sectional 199
 instruments cassettes 7
 intraligamentary syringe 51
 intra-oral radiograph 17
 intra-oral x-ray machine 25
 irrigating syringe and disposable needle
 endodontic 133
 surgical 160, 179
 Iwanson gauge 191
- jacquette scaler 239
 Johnson contouring pliers 213, 261

- kidney dish 181, 200
- Kilner cheek retractor 165
- latch grip bur 77
- Le Cron carver 255
- lead apron 27
- lentulo spiral filler 133
- lentulo spiral filler 133
- ligature cutter 221
- ligature tucker 217
- ligatures 211
- light reflecting wedges 117
- light wire pliers 223
- local anaesthetic set-up
- local anaesthetic syringe 49, 51
- long shank bur 79
- long shank surgical bur 79
- low volume suction 41, 46, 109, 141, 260, 266
- lower deciduous anterior extraction forceps 159
- lower deciduous molar extraction forceps 159
- lower permanent molar extraction forceps 157
- lower permanent premolar extraction forceps 157
- lower permanent root extraction forceps 157
- mandrels 79, 266
- Mathieu ligature pliers 219
- matrices and matrices systems 113–123
 - BiTine 115
 - stainless steel 113
 - T-band 113
 - celluloid strip 113
 - stainless steel 113
 - sectional 115
 - Hawe Supermat 115
- matrix retainers
 - Sigveland 113
 - Tofflemire 113
- matrix set-ups
 - celluloid strip 119
 - Hawe supermat 123
 - sectional matrix and BiTine ring 120–121
 - Tofflemire retainer and stainless steel band 118
- Mauns heavy duty pliers 227
- mayo needle holder 175
- McKeeson mouth props 160, 163
- mershon band pusher 215
- messaging gun 183
- metal ruler 37
- Millers articulating forceps 107, 233, 266, 267
- Minnesota retractor 167
- mirrors 229
- Mitchells trimmer 169, 225
- modelling instrument 103
- modelling wax 257
- modules 209
- Mortonson-Clevedent plugger 93, 142
- mosquito artery forceps – curved and straight 175, 219
- mouth mirror and handle 33, 38, 46, 109, 124, 141, 160, 188, 232, 250, 266
- mouth spreader/gag 163
- nabers probe 35
- nail brush 181
- Nance pliers 223
- needle holders 56, 175
- needle stick protector 53
- needle 49
- NiTi rotary instruments 131
- nylon band seater 215
- occlusal radiograph 17
- ochsenbein chisel 185
- omega pliers 223
- orange ring conventional handpiece 71
- oro-pharyngeal airway 187
- orthodontic appliance, fixed 203
- orthodontic appliance, removable 203
- orthodontic band 207
- orthodontic bracket card 231
- orthodontic brackets, metal and ceramic 207
- orthodontic pliers
 - Adams spring forming 227
 - Adams universal 227
 - Coon's ligature 219
 - distal end cutter 221
 - How(e) 225
 - Johnson contouring 213
 - ligature cutter 221
 - light wire 223
 - Mathieu ligature 219
 - Mauns heavy duty 227
 - Nance 223
 - Omega 223
 - posterior band remover 215
 - separating placing 213
 - triple beak 221
 - tweed 225
 - Weingart pliers 217
- orthopantomograph 21
- paint scraper 253
- panoramic radiograph 21
- paper points, absorbent 137
- paper points, absorbent sterile 137
- patient relief wax 211
- peri-apical radiograph 19
- periodontal hoe 243
- periodontal probe 25
- periodontal probe, Williams 237
- periosteal elevator, Howarth 160, 167
- peso reamer drill 129
- plaster spatula 265
- plastic instrument 101
- plastic stick 247
- plastic wedges 117
- pluggers
 - Mortonson-Clevedent 93
 - universal Hobsons 93
- pocket mask 187
- polishing/finishing strip, composite 107
- post kit, prefabricated 263
- posterior band remover 215
- probes
 - BPE/CIPTN 237
 - Briault 37
 - furcation 239
 - Nabers 35
 - periodontal 35, 250
 - sickle/contra-angled 35
 - Williams 237

- prophyl angle attachment 249
 prophyl conventional handpiece 46, 71, 232, 250
 prophyl ring 249
 push scaler 241
- radiation monitoring badge 29
 radiograph 17, 19, 21
 red ribbon wax 200, 255
 retractors
 Austin 160, 165
 Bowdler 160, 165
 cheek 229
 Kilners 160, 165
 Minnesota 167
 mouth spreader/gag 163
 root canal explorer 127
 root canal hand files 131
 rotary paste filler 133
 rubber cup 74, 80, 232, 250
 rubber dam – setup
 rubber dam clamp forceps 59
 rubber dam clamps 59
 rubber dam frame 59
 rubber dam material 63
 rubber dam punch 59
 ruler (see metal ruler)
- safety glasses 3
 safety syringes 53
 saliva ejector 41, 46, 56
 scalers
 implant 247
 jacquette 239
 push 241
 sickle 241
 scalpel blades – disposable 142, 160, 169
 scalpel handle and blade, disposable 142, 160, 167
 scalpel handle, stainless steel 142, 160, 167
 scissors
 Beebee 109, 259
 blunt 109
 surgical 171
 suture 179
 sectional matrix 115
 sectional matrix and BiTine ring set-up 121
 self aspirating local anaesthetic syringe 49, 53
 separator placing pliers 213
 shade guide 99, 266
 sharpening stone 247
 sharps' disposal container 55
 sickle scaler 241
 sickle/contra-angled probe 35, 38, 46, 109, 124, 141, 188, 250, 266
 Siqveland matrix retainer 113
 spatulas
 anodised aluminium spatula 89
 plaster 265
 fish tail 265
 impression wooden handled 263
 broad bladed 89
 Weston 89
 spoon curette 169
 spoon excavators 85, 142
 sterilisation pouch 9
 straight handpiece 69, 160, 233
 suction
 surgical 160, 173, 188
 high volume 41, 46, 109, 141, 250, 266
 low volume 41, 46, 109, 141, 250, 266
 saliva ejector 41, 46, 109, 141, 250, 266
 super pluggers, Teflon tipped 101
 surgical bur 79, 142
 surgical scissors 171
 surgical curette 160, 169
 suture scissors 179
 sutures 177
- T-ball burnisher 95
 T-band matrix 113
 temporary crowns 259, 266
 thyroid collar 27
 tissue dissecting forceps 177
 Tofflemire matrix retainer 113
 Tofflemire matrix set-up 118
 toothed dissecting forceps 177
 towel clips 163
 triple beak pliers 221
 triple tray 199
 tweed pliers 225
- ultrasonic cleaner 13
 ultrasonic scaler tips 142, 247
 universal curette 243
 universal Hobsons plugger 93
 upper left and right permanent molar extraction forceps 153
 upper permanent incisor extraction forceps 155
 upper permanent premolar extraction forceps 155
 upper permanent straight extraction forceps 155
 upper root extraction forceps 155
- Vernier gauge 193
- Wards carver 93
 Warwick James elevator – left, right and straight 145, 160
 wax knife 255
 Weingart pliers 217
 weston spatula 89, 232
 Williams periodontal probe 237
 Willis bite gauge 253
 wedges
 light reflecting 110, 117
 plastic 110, 117
 wooden 110, 117
 wooden wedges 117
- x-ray viewer 23